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VOLUME I SEPTEMBER, 1917 NUMBER 3

TABLE OF CONTENTS

HAROLD E. BURTT. Professor Münsterberg's Vocational Tests.... 201
F. C. HENDERSCHOTT. Psychology and Business..... 214
H. N. RASELY. Improving Business Correspondence..... 220
A. A. ROBACK. The Moral Issues Involved in Applied Psychology. 232
A. W. TRETTIEN. Practical Applications of Psychology in the Treatment of Certain Psychopathics (and other Neuropathologies)..... 244
JOSEPH K. FOLSOM. What can the Psychology of Interests, Motives, and Character Contribute to Vocational Guidance?.. 253
EDWARD L. THORNDIKE. The Curve of Work and the Curve of Satisfyingness..... 265
HERBERT W. ROGERS. Psychological Tests for Stenographers and Typewriters..... 268
L. R. GEISSLER. Association-Reactions Applied to Ideas of Commercial Brands of Familiar Articles..... 275
BOOK REVIEWS..... 291
NOTES..... 298
R. M. YERKES. Psychology and National Service..... 301

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THE
JOURNAL OF APPLIED PSYCHOLOGY

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PROFESSOR MÜNSTERBERG'S VOCATIONAL TESTS[1]

By HAROLD E. BURTT

I. INTRODUCTION

During the spring of 1916 Professor Münsterberg gave a series of mental tests to the members of his large course in elementary psychology. The work was undertaken primarily because of interests in vocational psychology and an attempt was made to correlate the results not only with collegiate standing but with individual estimates of vocational aptitude. The same tests were subsequently given, in whole or in part, to a small class of Radcliffe students, to 31 members of a western military academy, to 40 employees of an Ohio clothing house, to 23 executives and salesmen of a large New England manufacturing concern and to 72 employees of one of the leading Boston department stores. In some cases employers' estimates of the vocational ability of the persons tested were available.

At the time of Professor Münsterberg's death the original data from the 460 subjects had been corrected and scored and certain correlations computed for the Harvard group.[2] The vocational aspect of the tests and the interpretation of results for other groups than the Harvard students was barely begun. At the same time more detailed materials for some of the tests were being worked out and various forms of new tests were being devised with a view to future standardization.

The entire data was turned over to the writer by Mrs. Münsterberg with a view to posthumous publication. The

[1] From the Harvard Psychological Laboratory.

[2] A popular article based on this aspect of the tests was written by Professor Münsterberg for the *Harvard Illustrated*, 18, 170.

writer was in close touch with Professor Münsterberg and fairly familiar with his methods and purposes and, while it is impossible to do the matter justice, an attempt will be made to compute and interpret the results as Professor Münsterberg intended to do.[3]

The following account will comprise six parts: (1) a brief description of the tests employed; (2) norms for the various groups tested; (3) correlations for the group of Harvard students of test scores with class standing and the intercorrelations of some of the tests; (4) the differential vocational sensitivity of the tests on the basis of the extremes of personal estimates as to vocational aptitude in the Harvard group; (5) the vocational aspects of the tests indicated by the results from industrial concerns; (6) suggestions as to other new forms of tests and general vocational possibilities.

II. Description of the Tests

The test material was presented to the subjects in groups by means of printed blanks.[4] The thirteen tests used will be designated by letters of the alphabet.

Test A. *Free association.* Stimulus word (e. g. railroad, poetry) spoken by the experimenter. Subject writes a train of association words for periods of 1, 3 and 5 minutes in successive trials with different stimuli.

Test B. *Attention (intellectual).* Three hundred and fifty unspaced capital letters arranged in several lines, certain adjacent groups of letters forming a word. Subject underlines such words. For example in "hotbrdenexerfisaelieyur" are the words "hot, den, is, lie." There are 55 such words in the list. Time 3 minutes.

Test C. *Attention (perceptual).* Similar to the above, having 350 unspaced digits. Subject underlines adjacent pairs whose sum is 9. Thus in 65408618534927 are the pairs 54, 18, 27 whose sum is 9. Time 3 minutes.

Test D. *Construction by selection.* A list of several words such that by selecting one letter from each word the name of some famous American can be spelled. Thus: (1) *b*all, tur*n*, e*y*e, lar*d*, k*n*ife,—Bryan; (2) be*a*r, roa*d*, pi*n*e, ro*s*e, ho*l*e, tow*n*,—Edison. The italics are not indicated on the test blank. Five lists of this sort constitute the test. Time 4 minutes.

Test E. *Completion (intellectual).* Two hard examples for

[3] The writer is indebted to Professor Münsterberg's secretary, Miss Wilkins, and to Professor Yerkes.

[4] The form of all the tests is such that they can be reproduced on a typewriter without the use of special drawings or charts.

sentence completion, giving the first letter of each omitted word and indicating by asterisks the number of letters necessary to complete the word. Seven and nine words omitted respectively in the two selections. Time 2 minutes each.

Test F. *Completion* (*perceptual*). A list of words having only the first and last letters given; thus: p-l, a-y, w-h. Subject fills in any number of letters to make the word. In a second list the first two letters of the words are given; thus: cu-, tu-, ai-, and the words are to be finished. Thirty words in each list. Time 2 minutes each.

Test G. *Word building* with the letters a, b, e, l, r. Time 3 minutes.

Test H. *Decision.*[5] A group of 4 lines of vowels such as the following:

E U U O O U U E A A E U U E A A E U U O O U U E
A U A O U U U O U A U O O U A U O U U U O A U A
E O U O U O A U U A U U U U A U U A O U O U O E
U E E U O A U E E A E U U E A E E U A O U E E U

In the above group U occurs 42 times and the other vowels 18 times each. Seven other groups on the blank have the following ratios: O 42, others 18; O 30, others 22; E 42, others 18; U 30, others 22; A 30, others 22; A 42, others 18; E 30, others 22. Subject looks at the sheet and judges (without counting) in each group as to the predominant letter. Time 2 minutes.

Test J. *Reasoning* (*relation*). Twenty adjectives such as "busy, clumsy, cruel," printed in a column. Subject writes after each its opposite. Time 2 minutes.

Test K. *Reasoning* (*principle*).[6] Three rows of vowels A, O and U such as the following:

A U O A A
A O U
A U U A O A A A U

The O bears a constant relation to the other vowels in each line (in this case the middle). Six similar groups embodying the following relations: fifth from the right end; before the first U (counting from the left); second after the first U; second after the second A; first before the third A; as many places after the first A as this is after the beginning. Six minutes to discover and write down the various relations.

[5] Described originally in Münsterberg, H. *Psychology and Industrial Efficiency.* 1913. p. 86.

[6] This test was suggested by the Yerkes multiple choice method. *cf.* Yerkes, Robert M. The study of human behavior. *Science,* 39, 625.

Test L. *Reconstruction* (*perceptual*). Nouns with the letters disarranged. Subject discovers the word represented. Thus: "ettrul," "idolcocer" are "turtle" and "crocodile." Eight names of animals and eight names of cities in the United States. Time 3 minutes each.

Test M. *Reconstruction* (*intellectual*). A sentence with the first few words in the correct order but with the remainder arranged alphabetically, such as the following:

"The idea of mental tests is—abilities acquired and and compare discover demands inborn is mind of of practical the the the the them to to various vocations with." Two other selections of about the same length and difficulty. Total time for rearrangement of the three, 9 minutes.

Test N. *Sentence building* (used in place of test M with all but the Harvard group). Ten nouns and adjectives such as, "book, butterfly, green, house, picture, milk, serious, seven, smile, woman." Subject forms a sentence containing all these words. Two groups of this sort. Time 4 minutes each.

All the data except that for test N was corrected quantitatively and the results then transformed according to an arbitrary scale which varied for the different tests so that the final scores formed roughly a probability distribution with a minimum of 0 and a maximum of 10 points. For example in test B the correct underlining of 1-20 words gave a score of 0 points, 21-25 words 2 points, 26-30 words 4 points, 31-35 words 6 points, 36-39 words 8 points, 40 words or more 10 points. In this way a single digit from 1 to 10 represented the individual's performance in each of the 12 tests.

The tests occupied approximately two hours and in all cases were given in two sets on different days. About five per cent of the Harvard group were absent on each day and were given a chance to make up the work. None of the blanks were allowed outside the room, and as the total average score of those taking "make-ups" differed from the general average by less than two per cent, no appreciable error was introduced by this procedure.

In all the groups but two the tests were given by Professor Münsterberg. For the students in the military academy and the employees of the Ohio firm full directions were forwarded and a responsible person gave the tests.

III. General Averages

The average scores in the separate tests for each group of subjects are given in table I. The successive rows indicate the 13 tests and the columns indicate the groups. At the head of

each column is given the number of individuals in the group. At the bottom are the sums of the scores for tests B to L inclusive. A was scored by a slightly different method in some of the groups and the results are not strictly comparable.

A glance at the bottom row of the table shows that the rank of the five groups in the sum of the test scores is what might be expected on the basis of the selection of the groups. The Radcliffe students in an advanced course in psychology rank highest. The Harvard group ranks next as might be expected on the basis of selection. Then follow the military students in a secondary school who presumably were not as thoroughly selected by entrance requirements; the salesmen and executives of the wholesale concern, and finally the unselected clerks in a department store.

TABLE I

Test	Harvard (276)	Radcliffe (17)	Military academy (31)	Wholesale employees (23)	Boston dept. store (72)	Ohio dept. store (40)
A. Association.....	4.9	8.0	7.4	4.3	5.4	...
B. Attention (words).	5.4	7.0	4.1	5.1	5.5	...
C. Attention (letters).	4.4	7.9	7.0	4.8	4.1	...
D. Const. by selection	4.8	3.3	3.2	3.9	1.7	...
E. Sentence compl't'n	4.4	5.4	2.7	2.5	1.1	2.7
F. Word completion.	5.1	7.4	5.8	4.9	4.9	3.0
G. Word building....	3.3	4.9	2.9	2.3	1.5	2.1
H. Decision.....	4.2	4.7	4.4	3.9	3.5	...
J. Opposites.....	6.7	8.8	3.5	4.5	2.5	...
K. Principle.....	4.5	2.6	2.5	2.5	1.6	...
L. Rearrange letters.	3.9	3.8	3.0	2.7	1.2	2.9
M. Rearrange words..	5.2	...	...	...	...	...
N. Sentence building.	...	6.0	6.4	5.0	3.6	...
Sum B-L.....	46.7	55.8	39.1	37.1	27.6	...

If in the table we regard the Harvard group (which is by far the largest) as the standard and compare the others with it in respect to the various tests we note that the Radcliffe group is considerably superior (80%) in test C and considerably inferior (42%) in test K. The military academy group also excels the Harvard in C (59%) and falls farthest below it in J (48%) and K (45%). The wholesale employees fall farthest below the Harvard averages in K (45%) and E (44%), and the clerks are most inferior in E (75%) and L (69%). The most noticeable differences, then, are in test E, sentence completion,—frequently mentioned in the literature as a test of intelligence,—and in tests J and K which involve reasoning and the ability to perceive relations.

It is possible to examine the data from another standpoint, namely the ranking of the average scores for the ten tests within a given group of subjects. Thus test B yields nearly the highest score of the ten in every group. So does C, with the exception of the Harvard students. E stands relatively high in rank with both college groups, but relatively low with the other three groups. H ranks rather low with the college groups and relatively high with the others. J ranks the highest of the ten for the college groups and fourth or fifth with the others. K ranks very low for all the groups except the Harvard, where it ranks fifth. Here again the most striking thing is the superiority of the college students in tests E and J, sentence completion and opposites, tests of a distinctly intellectual order.

The ranking of the tests in the various groups do not intercorrelate highly except in a few instances. The ranks of the ten tests for the wholesale group and for the department store employees correlate to the extent of $.70 \pm .14$ by the foot-rule formula. The military group correlates with each of these to the extent of .62 and $.64 \pm .14$. All other correlations are less than .30.

IV. Correlations

Various correlations were computed for the Harvard group. It seemed interesting first of all to compare efficiency in this set of tests with class standing. Inasmuch as the group was composed of members of the four undergraduate classes the marks for the freshman year were taken as a standard. Arbitrary values were assigned to the marks of A, B, C, etc., and an average coefficient determined which represented the individual's college standing for the year. These coefficients were then compared with the sum of the test scores for the different

individuals. If the 276 members are distributed in tertiles of rank in both respects the results are as shown in table II.

TABLE II

CORRELATION OF CLASS STANDING WITH SUM OF 12 TESTS

	1st tertile tests	2nd tertile tests	3rd tertile tests
1st tertile class.....	43%	35%	22%
2nd tertile class.....	33%	28%	39%
3rd tertile class.....	24%	37%	39%

There is evidence of some correlation but it is not very striking. If the ranks are correlated by the foot-rule method the coefficient is $.127 \pm .026$. If class standing is correlated with the sum of the tests E and M (which perhaps lay more stress on intellectual processes) the coefficient is somewhat higher ($.178 \pm .026$). This rather low correlation coincides with the results of many similar studies. It suggests the fact that many students (in freshman year at least) do not work at their maximum level of intellectual efficiency.

Certain of the tests were correlated with one another, with class standing and with the sum of the tests by a rough use of the foot-rule formula. The only point of interest is that the sum of the tests correlated most highly with tests B and C,—the two attention tests. This suggests the fact that in these two tests the initial adaptation to the conditions of the test is slight and they are thus more reliable than other single tests in hasty application.

V. VOCATIONAL IMPLICATIONS OF THE TESTS IN THE HARVARD GROUPS

The Harvard students who took the tests were asked to give an estimate of their own ability as executives, salesmen and promoters or inventors. Each man was to give himself a total of 100% in the three fields. Then groups were formed on the basis of extremes of such estimates for a comparative study of the vocational sensitivity of the tests. Thus a group was formed of approximately 20 students who estimated their ability as executives at upwards of 80% and such a group contrasted with another formed of about 20 who estimated their executive ability at 10% or less. Similar groups of about

the same numbers were formed for salesmen and inventors. Individual estimates of this sort would undoubtedly be unreliable in the middle range, but it is probably safe in a preliminary survey, to attach some validity to the extremes of personal estimates.

The average scores of each of these six groups for each of the twelve tests are given in table III. The successive columns give the averages for the 12 tests A to M. The first row gives the average in those tests for the group of good salesmen, the

TABLE III

	Test	A	B	C	D	E	F	G	H	J	K	L	M
Salesmen	Good	5.7	6.1	4.8	4.9	4.0	6.0	3.6	3.6	6.8	4.8	5.1	5.2
	Poor	4.8	4.9	5.5	5.3	5.7	5.5	3.2	5.1	6.3	4.4	3.2	4.5
	%superiority good	19	24	-13	-8	-30	9	12	-29	8	9	**59**	15
Executives	Good	5.0	5.0	4.7	4.5	5.2	4.7	3.1	4.2	6.9	3.7	3.5	5.4
	Poor	4.2	4.3	4.3	2.8	3.2	5.1	3.1	3.2	6.3	5.2	2.9	5.2
	%superiority good	19	16	9	**61**	**62**	-8	0	**31**	9	-29	21	4
Inventors	Good	4.0	4 5	5.2	3.3	4.4	4.8	2.7	4.4	6.4	5.2	2.2	5.2
	Poor	4.1	5.3	5.8	3.7	3.5	4.8	3.1	3.7	6.2	3.6	3.4	5.3
	%superiority good	-2	-15	-10	-11	26	0	-13	19	3	**44**	-35	-2

second row for the group of poor salesmen and the third row the per cent by which the figure in the first row exceeds the corresponding one in the second, i. e. the per cent by which the good salesmen are superior to the poor in the various tests. Similar figures are given in subsequent rows for executives and inventors.

A glance at the rows of per cents difference shows the tests which in the above group are most sensitive to the three vocational aptitudes. In salesmanship the most marked results are with test L (rearrangement of letters). In this test the good salesmen are 59% superior to the poor and the difference is 3.2 the probable error of difference. The next greatest difference is in test B (attention-intellectual) with a difference of 24% which is only 1.8 the probable error of difference. The superiority of the good salesmen in the other tests is slight or negative.

With executives there appear three fairly sensitive tests,—D (construction by selection) and E (sentence completion),

with differences of 61% and 62%, almost equally sensitive, and H (decision), with a difference of 31%, sensitive to a somewhat lesser degree. The three differences are respectively 3.6, 3.3, and 2.0 the probable error of difference.

Only one test appears at all sensitive to inventive or promotor ability, viz.: K (principle). The difference is 44% and is 3.4 the probable error of difference.

Thus, assuming a certain validity in the methods of selecting the above groups, there are one or more tests which appear somewhat sensitive to each of the three vocations in question. A further problem is the comparison of these figures with results of the application of the same tests to efficient and inefficient salesmen and executives in actual practice.

VI. Vocational Implications of the Tests in the Industrial Groups

The employees of a New England wholesale concern who were given the tests were also rated by their managers with reference to ability as salesmen or executives. It was thus possible to select efficient and inefficient groups of each sort,—the only difficulty being the small size of the groups.

Thus comparing the test results of the 5 best salesmen with those of the 5 worst and computing the data as in table III there appear possibly significant differences in the following tests:

Salesmen

Test	C	D	F	J	L
Good	7.5	5.5	7.5	5.5	3.5
Poor	4.0	2.4	4.0	2.8	1.6
% superiority good	87	**130**	87	96	**120**

The good salesmen actually score more highly in most of the tests but the greatest differences are manifest with D (construction by selection) and L (rearrangement of letters). The latter is the test which appears most clearly differential of salesmanship ability in the Harvard results.

Similarly comparing 4 good executives with 3 poor ones: Here although the good executives are superior in most of the tests, the greatest difference is for E (sentence completion) which yields the greatest difference also in the Harvard group.

Four of the tests, E, F, G and L were given to 40 employees

EXECUTIVES

Test	E	G	K	L
Good	6.0	5.5	4.5	5.0
Poor	1.3	2.0	1.3	2.0
% superiority good	360	175	246	150

in an Ohio department store. A person familiar with the individuals selected 10 good salespeople and 10 poorer, also 10 good executives and 10 poorer. The results for the salespeople are negative. In none of the tests are the good salespeople appreciably superior on the average. This is possibly due to the small size of the group and its selection. The groups of salespeople were extremely variable, having a mean variation of over 100% in several instances. With the executives the results are clearer as indicated by the following:

EXECUTIVES

Test	E	F	G	L
Good	4.8	3.4	2.4	3.8
Poor	2.2	2.4	1.2	2.0
% superiority good	118	42	100	90

The good executives are superior to the poor in every test but especially so in E (sentence completion). It is to be noted that E gives the most distinct results in the two studies just mentioned.

The salespeople in the Boston department store who took the tests were selected by the superintendent so as to give a group of 35 efficient and one of 35 inefficient clerks. The tests which yield the greatest difference in the average scores of the two groups are as follows:

SALESPEOPLE

Test	D	E	F	L
Good	1.9	1.4	5.5	1.5
Poor	1.4	.9	4.2	1.0
%superiority good	36	55	31	50

Test E (sentence completion) and L (rearrangement of letters) show the greatest sensitivity to salesmanship ability in this group. The latter shows similar sensitivity in the other studies just mentioned.

These results may be, of course, somewhat invalidated by the small number of individuals in some of the industrial groups and by the use of personal estimates of ability in the Harvard group, but it is a significant fact that certain of the tests are found to be consistently differential of vocational aptitude in all the various groups investigated. Test E (sentence completion) proves to be in the above study a test par excellence of executive ability, and test L (rearrangement of letters) of ability in salesmanship. The results manifestly warrant further investigation.

VII. Suggestions for the Future

In addition to the above, a number of new forms of tests were being devised by Professor Münsterberg with a view to further vocational study and standardization.

1. Test of observation. A series of numbers arranged thus:

12	3	14	9	5
7	15	17	2	21
22	1	8	11	18
24	6	13	23	16
20	25	10	4	19

involving, however, numbers from 1 to 100 instead of merely numbers up to 25. The subject marks numbers 1, 2, 3, etc., in order up to 100 with a time limit.

2. Test of foresight. A labyrinth made of letters x and o, thus:

Z	o	o	o	x
o	x	x	o	o
x	o	o	o	o
x	o	o	x	x
o	o	o	o	A

but much more complicated and involving 224 letters. The subject starts at A and by tracing on the o's reaches the opposite corner Z.

3. Test of suggestibility. Two columns of words at opposite sides of the sheet, thus:

	tree
	bird
	cat
dog	ink
	blue
	grass
shirt	boat
	collar
	eye
	library
book	loud
	truth

The subject has to quickly indicate which words in the second column are on the same line as the various words in the first column. For example "ink" is on the same line with "dog," but the word "cat," a line above, is more strongly associated with "dog" and may act as a suggestion and appear on the same line. Similarly "collar" is a line below "shirt" but more strongly associated with it than "boat." Long lists of this sort may give an index of suggestibility.

4. Test of "steadiness." A selection beginning as follows: phree stchraute blyoovcextbhl rhyiusi elliffmee tsrheaclslt bluoysree pirte. By reading the alternate letters of each word beginning with the second, one may decipher the sentence, "He that loveth his life shall lose it." In other material every third or fourth or fifth letter is to be read. Thus: obnvttrweovniugxcuiecvbitpuythercuexciurswe spells "together" by reading every fifth letter. The ability to hold a given setting and rapidly decipher a fairly long selection is an index of "steadiness."

5. Test of recognition. Two stories differing only in minor details. The subject reads them successively and in the second indicates the points that have been changed.

6. Test of division of attention. A selection in which alternate words beginning with the first form one story and alternate words beginning with the second form a second story, thus: "I The want little to house consult where you, I Professor was Brown, born, about and a in most which baffling I case passed of the sudden earlier death years under of suspicious my circumstances. life." The subject reads the selection intact without pause and then reproduces the two stories as far as possible.

The ultimate intention of Professor Münsterberg was to arrange two sets of tests,—one for vocational guidance and one for vocational selection. In the former case the individual

was to be provided with a set of blanks for each of the tests used. An elaborate and detailed set of examples for the given test was to be given on the first sheet and the subject was then to do the tests on the remaining sheets after having the method made clear by the examples. Materials arranged in this way were to be provided for each test. Then by comparing his results with vocational norms for the given tests the individual could determine his aptitude. A somewhat similar set was to be provided for employers interested in vocational selection, although the two sets would not be identical. Tests involving suggestibility, for example, would not be feasible for auto-experimentation.

In providing these sets the tests which proved in the above and in other studies to be the most sensitive to vocational aptitude were to be standardized with more exhaustive material and vocational norms determined. It would seem that of the twelve tests used in the above investigation the most profitable ones to standardize would be tests of rearrangement of letters for salesmen and completion tests for executives.

PSYCHOLOGY AND BUSINESS

By F. C. Henderschott,
Executive Secretary of the National Association of Corporation Schools

Because of my position as the founder of The National Association of Corporation Schools or, perhaps more correctly stated, as originator of the idea upon which the Organization is founded and, further, because of my connection with the Organization since its inception as Executive Secretary and the working officer, you have asked me to furnish an article for the Journal of Applied Psychology setting forth a resumé of the problems and a means of solving them in connection with the human element in industry.

So far as I am informed there is not sufficient record of actual accomplishment, by means of psychological tests, to warrant definite conclusions as to the value of such tests in the selection of individuals for definite tasks. Something has been done, more has been undertaken. Perhaps Walter Dill Scott, in the course of a year or two, will give us, from his psychological laboratory at the Carnegie Institute of Technology, something definite, something conclusive, something practical as to the application of psychology in efforts to pre-determine the inherent ability plus the development of the individual. Having accepted such methods of analysis as worthy, having determined that the information gained can be applied in a practical way, then vocational placement efforts may be made valuable.

At the moment, however, while certain of the larger industrial corporations of the United States have carried on experiments, psychological in character, in connection with their employment divisions, it is doubtful if there have come into existence any accepted standards which may be safely relied upon to justify the hope that psychological tests may prove of any considerable value in the employment departments of industrial institutions.

Other than efforts to pre-determine what particular class of work individuals are best qualified for by natural endowment, through training, and other development with experience as a basis, there are six distinct problems upon which information is sought in relation to the individual and his work.

(1) A lack of understanding, almost universal in extent

upon the part of the individual, as to the law of rewards.

(2) The absence of standards, sufficiently understood at least, by which the individual can measure his comparative value as a worker and thereby determine his position among his fellow men.

(3) A lack of the element of leadership—or a lack of knowledge of methods through which latent talent for leadership may be aroused and developed.

(4) A lack of information about or understanding of the earlier periods in the history of the world and of how civilization has developed.

(5) A lack of civic vision on the part of both executives and workers of industrial institutions.

(6) The lack of an equitable system to insure a just distribution of rewards earned.

In discussing the first of these classifications, the average youth seeks immediate reward. If his efforts find a reward at the close of the week stimulation is relatively easy. If the reward is delayed until the end of the month a less number will participate in the effort. If the reward be further delayed for a period of a year only the exceptional individual can be interested. And should the development take the form of the ultimate and larger reward which is gained only through the more complete utilization of the individual's latent talents accompanied by unusual exertion for a long continued period, only the so-called "genius" possesses vision sufficiently strong to fully appreciate the fact that reward begins with development and keeps pace to the end.

This condition undoubtedly accounts for the fact that the positions which pay the largest salaries usually seek the man, whereas the positions which pay smaller wages are eagerly sought for by the crowd.

If psychology can be applied so as to stimulate vision and to create a more complete understanding as to the law of rewards, the progress of the human race and especially the progress of industry, dependent upon human elements, will be much accelerated.

Second: Because of faults in history, and especially because of the eulogistic character of the biographies of men who have accomplished unusual things, the average boy is prone to reach a decision, more or less final in character, which rather depreciates his individual characteristics and possibilities.

The average youth does not understand the mistakes; failures with their resultant depression and those other ele-

ments which go to make up the negative side of character and are common to all mankind and comes to believe that men of the type and position of Washington, Lincoln, Clay and Webster possessed great inherent qualities which he does not possess and can not hope to attain in his individual growth. Oftentimes the youth goes even further and conceives deifying qualities in contemplating the character and accomplishments of men like Edison, Roosevelt and Burbank, whose work is still unfinished.

Again, it is equally true that the average boy has but small if any real understanding as to what his earning capacity really is and just what would be required of him to increase that capacity and the extent to which development might be possible.

It is a human failing to believe that we are underpaid for our work, but, should a situation arise through which the individual could form an impersonal judgment—if such a situation could be brought about—it is very doubtful if any large percentage of individuals would give themselves a job at the wages which they are drawing. Especially is this true in relation to employees of institutions large in character, where judgment and vision might prove the determining quality.

This condition is at the bottom of the unrest of the so-called laboring classes. If, by the application of psychology, a system could be determined through which each individual in the institution might feel a reasonable assurance that his reward in the form of wages or salary is fair and equitable in comparison with the rewards meted out to other individuals who collectively make up the working forces of the institution then unrest would be minimized or would cease and the wage problem would become more scientific and better organized.

Third: The moment one develops the characteristics of leadership he draws away from the crowd. The crowd never progresses. The individual finds himself in a new and strange environment, a situation comparable to a sudden ascent to the top of a tall building. There is not sufficient time nor opportunity to readjust his vision. So in the development for leadership, the individual finds himself in strange surroundings with no familiar guideposts, no familiar standards for purposes of comparison.

Many fail through lack of adaptability. Many more fail because of an over-estimation of their individual importance. Other failures may be attributed to uneven development or inherited tendencies which result in a passion for autocratic power and lack of sympathy with the less fortunate of their fellow men.

A better understanding of what characteristics are demanded in leadership and how latent ability may be aroused and developed, would materially lessen the number of individual failures. Here is an opportunity for the application of psychology to the betterment not only of the individual, but also of industry, which would result in a more constant and permanent advancement of society as a whole.

Fourth: Because of religious training and because religious ideals lie in the field of belief rather than in the field of knowledge, there is no well conceived information as to the earlier periods of the human race.

The more modern, and especially the more bold of the historians, are inclined to the theory that man's first stage was that of savagery and that the human race came out of that stage through the discovery of fire and the use to which this force could be put. The development of this theory, however, seriously upsets many religious convictions with the resultant condition that knowledge of the earlier period is contradictory and involved with religious beliefs.

If man did develop out of a stage of savagery little better than that of the more intelligent of the beasts and if fire, the conception of the gods and their powers, and finally the conception of the one God of Spirit has been a large factor in the progress of the human race toward a higher and more godlike condition, then it is time that myths and beliefs, which have outlived their usefulness, were swept aside.

The fact that a majority of scientists and psychologists are classed as agnostics and atheists may be attributed to an effort on their part to differentiate as between the field of knowledge and the field of belief.

It is not that the scientists and psychologists reject God and the immortality of the human soul so much as that they refuse to accept a certain theology and reject creeds, the teachings of which are sincerely believed and devoutly adhered to by the masses, but nevertheless beyond the horizon of the human mind.

The youth who has thorough information as to the basic laws of the physical world and likewise the basic laws of the mental world is constrained to attach greater importance to the results of scientific investigation—as for example—to Watt's discovery that through the application of heat to water there was secured a powerful agency of energy, than will be attached by the youth who is prone to believe that such a revelation is supernatural and the will of a Supreme Power rather than the result of human activities.

If an application of psychology can be made to this condi-

tion so that human minds, especially the minds of the young, will be freed from the distracting influences which emanate from the field of belief to contradict well authenticated information in the field of knowledge, there must follow a more logical and a more permanent progress toward better standards in living.

Fifth: Industry, originally carried on in the home, has assumed new and strange forms. When industry was a feature of the home life it was largely devoid of profit and was administered to meet the needs of the family or at best the community. But through the use of manufactured power and the assistance of engineering skill production has ceased to be the predominant problem in modern life and competition has reached a state of decay. This condition has given rise to the modern corporation. It was natural that those who guided and administered corporation activities should have sought profits, as under the second stages of industry, or after it was removed from the home and became a community affair.

Inability to produce enough to satisfy the demand makes marketing by the competitive system possible. The law of supply and demand became firmly established, but when production exceeded demand, at least such demand as then existed, competition was no longer effective.

The new period of co-operation is not yet fully instituted. The "growing pains" of this period produced the Sherman Law and also an antagonistic attitude on the part of consumers toward big business.

It is evident to thoughtful, reasoning mentalities that marketing must be accomplished on a basis which will return a fair and just profit to the producer if there is to be permanent prosperity. Here again an application of psychology may be made in determining standards—not only standards of profits, but standards of production, standards of distribution and standards of ethics in marketing.

Also, there is required the development of a civic vision, which will add a more complete understanding on the part of the people as a whole, as to the rights of the producer, the distributor and the consumer. The tendency has been, even among larger industrial institutions, to disregard factors other than those contributing to their own interest and their personal prosperity. Now it is a self-evident fact that when our transportation systems are busy and prosperous our factories are operating at capacity, and there is a market for the produce of our farms and on a profitable basis. In other words, individual industrial institutions cannot conduct their

businesses apart from the peace and prosperity of industry as a whole.

There is need of a civic development which will visualize this picture and to the end that there may be united effort and a willingness to co-operate, not to the end that there may be profit and prosperity for the individual, but for all industries and all people.

Sixth: Under this classification the discussion takes us into the field where reign the contentions of the socialogist, the socialist, the I. W. W. and all others who are warring with the established order of things. Theoretically and ideally there should be equality of opportunity and equality of reward according to merit! Is this possible?

That there cannot be equality of reward without determination of merit has been amply proved. The theory that all should contribute to a general bread-basket from which all may draw according to their needs has been many times proved a Utopian theory but impossible of realization. As against this practical demonstration of the fallacies of the ideal relation of "one for all and all for one," there is the other and more selfish side of the situation, namely, each individual securing through property rights and superior development all that he may be able to force from the general bread-basket into his own pocketbook.

Somewhere between these two extremes lies the true solution. It may be in collective stock ownership in which the workers share, it may be in retirement pensions, it may be in group insurance, sick and death benefit plans, thrift organizations and the many other activities commonly known as welfare movements. Or it may be in part in this kind of activities and in part through plans and systems as yet indeterminate. But there is a growing school of thought continually enlarging in its scope, which is firm in its convictions that property is not the first consideration in the attainment of happiness, but is rather a means to an end, and that property must be relegated to its proper sphere of usefulness and not made the continuous bone of contention. To my mind here is another opportunity for the application of psychology, perhaps having as its object a unanimity of thought rather than definite labor legislation.

It may thus be seen that the opportunities for the application of psychology, through industry, to the end that organized society may be improved and the happiness of the individual increased are almost endless and the promise of resultant benefits very great.

IMPROVING BUSINESS CORRESPONDENCE

By H. N. Rasely, Correspondence Supervisor,
Norton Company, Worcester, Mass.

Each day letters are playing a more important part in the life of every business firm and the practice is growing. Letters are coming to be more and more depended upon to complete many of the important transactions and practically all of the smaller ones. Some organizations have found it possible to get along without the aid of salesmen, but none would attempt to exist without the aid of the letter.

This widespread use of the mails has brought about a condition which most of the progressive business men are just beginning to realize—there is a scarcity of well trained business letter writers. The schools have not as yet caught the true significance of the situation. This is not to be wondered at since schools that previously have given the teaching of business subjects any attention have, for the most part, followed the needs of the business firm in so far as they knew what the needs were. Since business itself is only beginning to realize what it means to have well trained correspondents the fault cannot be laid at the door of educational institutions.

Skilled labor is a term that does not need to be explained. The employer has demanded a certain amount of skill on the part of those who apply to him for work of a particular nature. The stage has now been reached where he must make the same demand of those who write his letters.

The letter is the delicate thread of contact that exists between the firm and those who use its products. Because of the complexity of commercial relations today there are many users of products, who know the manufacturers only through the letters which are received from them. Personal contact is impossible; the letter has been substituted and it must be relied upon to create the same effect as the personal contact would. This condition has put some rather heavy burdens upon letter writers. To equip them to carry this load successfully, it is necessary that a well defined course of training be given to those who are to be entrusted with this important task.

One organization, realizing this fact, has for the past two years been actively engaged in strengthening its letter writing force by giving each man a certain amount of training in dicta-

tion and then subjecting his work to the criticism of a department organized for the purpose. Concentration on a subject of this kind for so long a period has accomplished a great deal more than was conceived of when the work was originally started. Lost motion and waste energy in many cases have been eliminated which has meant a direct saving of money. This is in addition to the other results which have been obtained but which are more or less intangible. The indirect benefits were the ones originally aimed at. That the effort has been repaid from this one source alone has been demonstrated to our satisfaction, but the scope of this article does not allow of space being given to prove this statement.

It is the intention, in this article, to bring out in a brief way some of the things which have been accomplished since this work has been in progress, and to show the method of attack.

The firm should be regarded as having two representatives, the personal and the written. The personal representatives in the case of this organization probably average from 200 to 300 calls a day. The written representatives make between 700 and 800 calls a day, for this is the number of personally dictated letters which leave the mailing room each day on an average.

Throughout the entire process the letters, or written representatives, must perform duties identical with those demanded of the personal representatives. This similarity of purpose or function should always be kept in mind.

Some of the things which letters are called upon to do are to collect accounts, to quote prices, to make adjustments, to sell goods direct, to give information regarding shipments, and many other subjects. The written representative has certain disadvantages in that the man behind the letter does not know personally the one to whom he is writing. He cannot judge of the immediate effect of his words upon the reader, which, were he in personal contact with his party, he could detect by noticing his facial expression. In addition many things can be said in conversation which would be regarded as aside from the question at hand, were the same thoughts expressed in writing. The letter must produce the effect of a conversation without actually being a reproduction of the conversation.

It is necessary that business letters be interesting, that they have a friendly touch, and what is of greater importance they must make an endeavor to impress their message upon the reader. It is the purpose of the letter to drive home the fact or facts contained in it or else the letter has very little excuse for its existence.

Those who receive and read business letters should realize that the ones who wrote them were live, thinking individuals, people who were interested in their work and in their customers. If the letter writer cannot take this attitude then he should not be allowed to send out these impression creators. In our case it is desired that those who read our letters should experience the same reactions that they would were they to come into personal contact with the ones who wrote them.

It is possible to compare a letter to a person. When we meet or talk with a man who has vim and life an impression of that person is made upon us. We feel that we are under the influence of a character. A totally different impression is made when we meet some spineless, shiftless, characterless individual. In fact the difference is quite noticeable. These same differences in impression can be made by letters. A letter can be said to have character or to lack character. Every time a letter is read an impression is made. People are unconsciously analyzing each other in their minds and letters meet with the same treatment. That this is true, the writer has proved for himself by noticing the many hundreds of letters which have come back in answer to those which have been sent out. This belief is further strengthened by the result of a field investigation where many purchasing agents of very prominent organizations as well as those of the lesser type were interviewed.

The person selected for dictation work is first interviewed by the Correspondence Supervisor. He is then taught to use the phonograph which is the dictation medium and is kept at it until he thoroughly understands how to use it. Clear dictation is very essential in order that what is said may be transcribed in a minimum amount of time, thus keeping the operating cost as low as possible.

The next step is to give the new dictator a very complete idea of the requirements and just what will be expected of him. It is then necessary for him to study a 70 page manual which contains instructions bearing directly on his work. This manual fills a very important place in the daily life of those who write our letters. Each one has a copy of it in his desk for ready reference.

When this ground has been covered the new dictator is given a number of letters to which he is required to dictate answers. The dictation is transcribed and is later criticised in company with the new dictator so that he will know just what to expect in the way of supervision of his work.

Should his work up to this stage demonstrate that he is not

fitted for letter writing, he can be dropped from the list of eligibles with recommendations as to what he had better do in the way of further training for himself if he wishes to be considered again at some future time.

Should he show a certain amount of aptitude, he is added to the dictating force but his name is kept on what is called our active list and nothing that he writes is allowed to leave the organization until it has passed the department of supervision. His work is followed in this way until we are satisfied that he can dictate letters that will be truly representative of the organization. If he does not develop satisfactorily during this additional trial period, he can then be dropped from the regular force with suggestions as to how he can better fit himself for the work. For people who have reached this stage there is most always a certain amount of minor dictation work which they can take care of satisfactorily in which case they are retained on the force.

When the new dictator reaches proficiency, his work comes up for criticism only periodically.

The procedure outlined is the same whether the new dictator has had experience elsewhere or not. It has been the writer's experience that the raw recruit reacts more quickly to the treatment than the person who has had correspondence experience, as we know correspondence experience today. The green man is not handicapped by habits wrongly formed.

A record is kept of each man's work so that it is possible to keep in touch with his progress at all times. The following figures will show just how closely this can be done.

Date	Letters read	Criticisms	%	Rewritten	%
January, 1917.....	217	106	48.8	29	13.4
February, 1917.....	149	89	59.7	23	15.4
March, 1917.....	310	62	20.0	11	3.5
April, 1917.....	252	43	17.1	7	2.8

Pressure on the points wherein this dictator was weak enabled him to make the improvement noted for the months of March and April.

The work of criticism of the dictators is carried on by means of a slip on which are given the points wherein it was found that our letters were faulty. The following is a list of these:

Clearness	Arrangement
Incomplete information	Correct words
Involved	Choice of words
Awkward	Courtesy
Conciseness	Tone

Sentence length	Policy
Needless words	Subject
Unnecessary information	Delayed answer
Repetition	Construction
Emphasis	Correctness

This list could be made much longer but the things which we have to contend with group themselves very nicely under these headings. When criticisms are necessary the principle violated is checked. The slip is then attached to the letter to which it applies and sent to the dictator. On the slip a space is given for remarks, and suggestions for improvements are written in this space. A criticism is never made unless the one making it can help the dictator improve the passage or passages under consideration.

It would be possible to make criticisms in pencil on the letters themselves. This is expressly avoided as every one has a certain pride in his work and to see it marked up is discouraging. There would undoubtedly be natural resentment to the work of criticism if this scheme was followed.

Needless words, stereotyped phrases, trite expressions many times spoil what otherwise might have been a good letter. It can safely be said that the character of a letter is often simply smothered because the writer has followed the same old humdrum, beaten track by employing forms of expression which have been used by thousands of so-called business letter writers for many years past.

Recently the writer received a large number of letters from one concern for the purpose of criticism. All were literally filled with such phrases as "valued favors received," and "thanking you for same." The majority finished with some form of the stereotyped participial closing of which the following are a few:

"Trusting that we may have the pleasure—we remain"
"Looking forward with pleasure—we remain"
"Regretting our inability—we remain"
"Thanking you for your prompt attention—we remain"
"Thanking you for your kindness—we remain"

Imagine a personal representative bringing his visits to a close with such meaningless expressions as those mentioned.

In addition to what has been spoken of, a letter must be clear, courteous and concise before it can be said that it is complete.

When we say clear we mean it should be immediately clear to the one who reads it. It should not be necessary for him to stop to study any passage. Many times a correspondent will

contend that a letter is clear but what he means is that it is clear to him. That he knows what is meant does not signify that the reader will. Lack of clearness has often led to misunderstandings and misunderstandings are many times responsible for loss of time and money. Every thought must be so expressed that only one interpretation can be taken from what is written.

Involved expressions are often due to long sentences and for this reason the long sentence should be avoided. Not only do long sentences lack clearness in the majority of cases, but they are hard to read.

Example: "We would thank you for your telegraphic advices in this matter so we may be enabled to give our customers some idea of what they may expect as to delivery as prompt as possible."

The following is just as clearly expressed and the sentence consists of 24 words instead of 34.

Revision: "Please telegraph your reply to us so that we may be able to give our customers some idea of when they may expect this material."

By short sentences we do not mean that they should be too short, for sentences can be so short that they are curt. The style which makes use of moderately long sentences and short sentences is best.

Big words often prevent clearness. The correspondent should choose the simple words heard in daily conversation. These are necessary for the average person and are always well received by the highly educated. The person who uses big words is seeking expression and loses sight of impression. The purpose of the letter is to impress the reader. Ideas are wanted and not mere words.

An example or two will bring this point out more forcefully.

Examples: "We can readily understand how the ineffable effect of this order must have placed you in a perplexed condition."

"It is not our desire that you hold this shipment, but on the contrary a direct antithesis of the case is desired."

To the average reader of business letters these sentences would not mean anything until after he had consulted a dictionary.

Awkward sentences are responsible for lack of clearness. An example will make it more clear why this is so.

Example: "The last two items are for cup wheels in which connection and if other than straight cups are required, we should receive a fully dimensioned sketch."

Revision: "The last two items are for cup wheels. If other than regular cups are required please send us a sketch showing full dimensions."

The use of terms that are not familiar to the reader also hinder his obtaining a clear conception of what was in the writer's mind.

Courtesy was mentioned as one of the fundamental principles of all letter writing. The correspondent should always be sincere and direct. If he has made or will make these two qualities part of his everyday life they will be reflected in his letters.

A discourteous letter or even a sentence can do more damage than can be repaired in a long period of time. Discourteous letters can destroy accounts that have taken considerable effort and large sums of money to acquire.

Quite often a correspondent is tempted to write a cutting answer to a letter that contained abuse and meanness. The dictator's Golden Text should be: "A soft answer turneth away wrath." He dare not give way to his feelings to the extent of writing a letter the equal of which he received. It will only prolong a disagreeable situation. The letter writer should bear in mind that a letter fight is the worst kind of a quarrel. It may never be possible to straighten out satisfactorily the ill effects which are likely to result from such a slip as this.

Sarcasm and sharp language have no place in the business letter. They merely tend to make the reader angry and it is not possible to do anything with a person when he is in that state of mind.

A grouch is an abomination. He cannot radiate sunshine and should not be allowed to give expression to his ugly spirit in letters. The business firm is jeopardizing its permanent success, or the amount of success it might have attained, in proportion to the number of such decided misfits as are carried on the payroll.

Patience is another virtue. Often times a customer will persist in maintaining a certain stand simply because the letter writer has not made his side of the case as clear and convincing as he might have. In other words he has not caused the reader to see his side of the case.

Another fundamental principle is conciseness. Only enough words should be used as are necessary to make the meaning clear. All of the information needed should be given, but no more. One large corporation in having their correspondents omit from their letters all needless words and meaningless

expressions has found that an estimated saving of $18,000 a year is made. The following example will show how the principle of conciseness is violated. In the revision all the information necessary for the complete understanding of the reader is given.

Dictated

"The Inspection Department has examined the wheel and finds it a grade R Crystolon wheel. They report that they cannot understand how this wheel got in with any 36 grade J Crystolon wheels, as its general appearance is quite different from them and they feel sure that the Grading or Inspection Departments would have noticed it at the time."

(59 words)

Revision

We find that it is a grade R Crystolon wheel. As it is quite different from a 36 grade J wheel it should have been noticed before shipment was made.

(30 words)

Conciseness in letter writing does three things:

It saves the correspondent's time in dictating
It saves the operator's time in writing
It saves the customer's time in reading

The following are examples of needless words which mean practically nothing. These can be found in a large number of letters written each day by the majority of business correspondents:

"Acknowledging receipt of yours of the above date we are pleased to advise that"
"We wish to advise that due to the fact that"
"In reply we wish to state that"
"In connection with this we wish to call your attention to the fact that"

Another important principle of letter writing is correctness and it should be considered from three angles:

Correct form
Correct language
Correct information

By correct form, we mean the appearance of the letter for appearance is often responsible for first impression.

All letters must be grammatically correct and if the informa-

tion is not correct there is danger of losing the confidence of the one being written to.

By creating the right dictation habits the correspondent is able to concentrate at the time of the dictation instead of waiting till after the letter is written before doing his real thinking. This saves the expense of revision.

That this saving through the establishing of habits of dictation is worth while is made evident by the following tabulation. This is a comparison of the number of letters rewritten during July, 1916, with those rewritten during the month previous to the writing of this article:

Month	Letters written	Total	%	Fault of operator	%	Fault of dictator	%
July, 1916....	7,548	222	2.9	74	33.3	148	66.6
April, 1917....	10,143	141	1.4	58	41.1	83	58.8

In the force which handled this work during April there were six girls whose experience in our employ was not more than three months. In some cases it was less than that, so this result is still better with that consideration.

The new transcriber or operator is likewise given a course of training. The method is similar to that followed in instructing the new dictator. For the girl there is a manual of some 70 pages and it is written in such a way as to answer practically every question which will come up in her letter work. Each girl makes a copy of the book for her own use and each page is talked over with her by one of the assistants in the Correspondence Supervision Department. She is given time to make a study of the manual and is then required to take an examination that consists of 100 questions which are so designed as to bring out the points which are not clear in her mind. Through this means we are sure that she has learned the correct method for writing our letters. The time which is usually given to breaking in is reduced and the girl is brought more quickly to the point where she is efficient and can realize maximum production.

The letters which the new girl writes are subject to inspection and not one is allowed to reach the dictator until it has passed through the department of supervision. In this way all corrections can be made, for the girl is not allowed to get her experience at the expense of the time and temper of the dictator. Recently we have had a turnover in our Transcribing Department of about 50%, due to the drain on the department through promotions into secretaryships and other positions. Despite this turnover the dictating force did not realize that any changes had been made for their work as it came back to

them was no different from that which the experienced girl turned out as far as the dictators were concerned. Everything in connection with the typewriting of the letter has been so standardized that the girl follows the same rule whether she is working for an official or for an order clerk.

In the supervision or inspection of the girls' work slips are used similar to those used for the dictators. The points on which we find it necessary to make criticisms are listed in the following columns:

Date	Grammar
Address	Reference marks
Subject	Margins
Signature	Uneven touch
Spelling	Strikeovers
Punctuation	Erasures
Tabulations	General appearance
Abbreviations	Titles
Capitalization	Spacing
Numbers	Miscellaneous
Amounts	

The method of criticising the operators is the same as that in the case of the dictator. All criticisms are made on the slip and if it is necessary to correct or rewrite a letter this request is made on the slip. No marks are made on the letters themselves.

For training purposes we have two rooms which are devoted entirely to this work. One is a room for new typists and adjoining it is a room for the training of new dictators. Both these rooms are fitted with the necessary equipment and all equipment is brand new. The rooms are located right next to the office of the Correspondence Supervision Department, so that they are easy of access and the supervisors can keep in close touch with the new people. Because of this it is possible to get them into line more quickly, since everything that they do can be carefully watched.

An additional advantage is that it helps the new girl for she is not disturbed by being surrounded with a large number of new people or conditions which would be strange to her. Every kindness and consideration is shown her at the outset in an endeavor to immediately put her at her ease. This attitude toward its people is one of the foundation stones of the organization and it is fitting that it be manifested at this particular point.

The same is true in the case of the dictator. He can concentrate much better when left alone and in this way establish the good habits of dictation before going out into the department

where in his work he will be subject to a certain amount of disturbance by telephone calls and other forms of annoyance.

One other activity of the Correspondence Supervision Department is to conduct a class in letter writing for the benefit of those who are taking the regular sales and office training course which is conducted each year by the company. During the past winter there were 21 men in the class, most of them college graduates. These men may remain in the home office or they may be sent into the field or to the branches.

Instruction is carried on through problems. Each week the students are given a letter problem which is taken from our regular work. Letters bearing upon the routine in each department of the organization are used so that when the student has finished the course he will have some knowledge of how the correspondence emanating from the different departments would be handled. The answers to the problems are severely criticised and the following week the points in each are brought up for discussion. This gives each person the benefit of the other fellow's thought in connection with the particular instance. Both the good and poor letters are read in addition to the letter which was originally written when the question under consideration was explained to the customer.

A record of the work of each is kept. For every problem given there is a list of the points that must necessarily be covered in order to make a complete reply. A specific letter problem will give a better idea of how this is handled. The one chosen is rather simple.

Problem

"Harris & Company, Framingham, Mass. sent us a pattern from which to make a wheel.

"The dimensions were taken, the blueprint made and the wheel manufactured and delivered.

"The pattern for some reason was destroyed. Later the customer wrote in asking that we return the pattern.

"Answer the customer's letter."

The following is the original answer in this case.

"Harris & Company
Framingham
Mass. Yours September 22

Pattern

"After making the wheel on your recent order your pattern for some unaccountable reason was destroyed.

"Enclosed is a copy of our blueprint from which the wheel was made. If this does not satisfactorily fill your needs, we will gladly make a pattern to replace the one you sent us or settle with you for having one made in Framingham.

"We want to make our error right and hope you will let us know what you decide to do

NORTON COMPANY
Order Department

There are three very important points or ideas to be considered when replying to this problem. These are given in the following list and are used to measure all the answers.

1. Pattern was destroyed or lost.
2. Send a copy of the blueprint which is all that is necessary to fill future orders.
3. Offer to replace or pay for having a pattern made if the blueprint is not satisfactory.

For each point in this case a credit of 33 1-3% is given. For each additional criticism that is necessary to make of the letter a finished product an additional credit is deducted from the total. This problem was given to 21 people with a class average of 76.7%. When it is considered that letter writers should be 100% or close to it, it can be seen that 23.3% of effectiveness was lost.

The work which we have done along this line can be adapted to any organization regardless of its size and the beneficial results will be greater or less, according to the amount of attention which is given to it.

THE MORAL ISSUES INVOLVED IN APPLIED PSYCHOLOGY.

By A. A. Roback

It seems rather curious that in the land where everything "*muss 'moralisch' sein,*"[1] as a great critic of Germany remarked over half a century ago, applied psychology should have been able to develop to the extent it did, without ever being put to the touch-stone of ethics, which has been applied in Germany to practically every department of human endeavor, including politics (Treitschke) and military affairs (von Bernhardi). In vain do we look for articles on the "*moralische Grundlagen*" or even on "*das Wesen*" of applied psychology. The most recent accretion to psychology seems to have been immune to such considerations.

The only writer, so far as I know, who saw the problem was Münsterberg, who had a wonderful knack for perceiving and defining issues, though it cannot be said that he always met them satisfactorily. Münsterberg's *Leitmotif* is the *subordination of means to ends.* This theme first appears in his *Psychology and the Teacher*[2] and is harped upon with slight variations in several of his later works. "No science of facts can show us any aims and purposes,"[3] is Münsterberg's dictum, and in the form in which it is put, one can scarcely dispute its truth.

We shall probably all recognize the force of the illustration appended, viz., that "the bridge builder, for instance, has learned his physics and thus knows all the laws needed to calculate the structure of a bridge, if the two banks of the river are to be connected at this spot. But no physical law can teach him that a bridge ought to be built over the river at this point."[4] The upshot of the discussion is that "economics, and not physics, decides as to the bridge; politics, and not geology, decides as to the tunnel, and ethics, not psychology, must decide the ends to which education has to lead the child. . . . ."

[1] Ferdinand Lassalle, *Bastiat-Schulze von Delitzsch oder Kapital und Arbeit.* 1864, p. 90.

[2] The germ of the whole point of view may be found in his *Grundzüge der Psychologie,* especially Chapter V.

[3] H. Münsterberg, *Psychology and the Teacher,* p. 22.

[4] *Loc. cit.,* p. 23.

In another work the doctrine crystallizes and takes on a more pronounced shape. "Economic psychotechnics," Münsterberg tells us, "may serve certain ends of commerce and industry, but whether these ends are the best ones is not a care with which the psychologist has to be burdened. For instance, the end may be the selection of the most efficient laborers for particular industries. The psychologist may develop methods in his laboratory by which this purpose can be fulfilled. But if some mills prefer another goal,—for instance, to have not the most efficient, but the cheapest possible laborers,—entirely different means for the selection are necessary. The psychologist is, therefore, not entangled in the economic discussions of the day. . . . He is confined to the statement: If you wish this end, then you must proceed in this way; but it is left to you to express your preference among the ends."[5]

The proposed limitation of applied psychology is justified by Münsterberg on the ground that all causal sciences have to put up with the same renunciation;[6] hence whatever shortcoming this may be, it does not attach solely to psychology.

Thus the applied psychologist is freed from besetting obstacles and is given a clear path only after submitting to the conditions of the direction. The method is quite convenient and might easily be endorsed by the present writer if it were not contestable on other grounds.

The cardinal fault in Münsterberg's system is undue abstraction; and nowhere is this fact so patent as in his applied psychology. We must all admit that it is well for each man to know his place, and not to overstep the bounds of his authority; but we can not accept the picture of this world as a great hierarchical war department where all orders are executed by the subalterns without questioning. In life such a state of affairs does not exist. The world may be a stage and all the men and women players, but most people have more than one part to play. Can we really divide the world into applied psychologists, legislators, attorneys, social reformers, engineers, etc.? Is it not true that legislators are frequently attorneys, and may not applied psychologists be social reformers as well as scientists?

If the different departments of human endeavor were really to be subordinated to one another after Münsterberg's fashion, we should scarcely ever have any reforms; we should have

[5] H. Münsterberg, *Psychology and Industrial Efficiency*, p. 19.

[6] *Cf.* his *Psychotechnik*, p. 40 and *Psychology General and Applied*, p. 351.

to wait a geological age for the legislator *qua* legislator or the legalist *qua* legalist to change his conservative, if not reactionary, way of thinking. It is about this type of man that G. F. Arnold says: "Whether wilfully or unconsciously blind to the fact that it has no application, he obstinately pursues the only method which he knows or wishes to know, convinced that salvation lies here alone, and affects to have solved the problem, though in truth he has all along been dealing with fictions and has arrived at the most artificial of results."[7]

As a rule, the impetus that saves the situation comes from another quarter. It is the jurist who institutes innovations in the legal profession and not the legalist for whom precedent forms the only means of orientation. It is the social reformer rather than the legislator who is responsible for progress in legislation. Why, then, shall we deny the applied psychologist the right of bringing his observations, not merely his technical knowledge, to bear on the general situation?

Yet there is a certain plausibility in Münsterberg's analogy, which we must examine before proceeding any further. The fact cited is true enough. The engineer does not undertake to say whether the bridge *shall* be built. It is his business to set the actual building operations into motion; but it seems extremely doubtful whether any Public Works Department or economic commission would decide on the building of a bridge without first consulting engineering experts as to the prospects and possibilities. It will thus be seen that the coöperation of superior and subaltern antedates the actual decision about the end to be attained.

But the analogy has other important flaws that must be exposed in the interest of our subject, and that only go to prove once more the danger of employing analogies in science.

Suppose we grant that in state affairs a given project may be launched without, in the first place, consulting the person or persons to execute the plan; even so, we cannot apply the analogy to the case of applied psychology in general. The situation is different in more than one respect; and it is remarkable that these differences have remained unnoticed, while the view of Münsterberg,—the theoretician of applied psychology,—seems to have reassured the devotees of that branch in the belief that their path is free from moral scruples.

The bridge analogy in reality opens our eyes to the issues involved. When we ask ourselves: Why is it that the same

[7] G. F. Arnold, *Psychology Applied to Legal Evidence*. 1913, p. 2.

illustration cannot hold of applied psychology, we discern three points of difference between the relation of the legislator and the engineer on the one hand, and the advertiser, let us say, and the applied psychologist on the other hand. They may be enumerated as the differences (a) between the *social* and the *individual* end; (b) between the *moral* and the merely practical or *expedient;* and (c) between the *objective as inorganic nature* and the *objective as human nature*. Those who do not fully grasp these distinctions will, of course, continue to see in applied psychology an instrument to be used without discretion at the behest of the first employer.

The legislative act that calls for the building of a bridge is presumably a *social* measure. The employer, however, who is anxious to receive suggestions as to the best possible manner of turning out a cheap quality of goods certainly has an *individual* aim before him. Converting these aims into utilitarian terms, it may be said that the object of the legislative act is primarily the greatest happiness or well-being of the greatest number, while for the *entrepreneur,* the goal is his own greatest happiness, frequently at the expense of that of the greatest number.

This first distinction was already alluded to by the writer in a more specific connection. "Although the applied psychologist must leave it for others to state what is desirable, and to decide on the state of affairs to be brought about, he must constantly have the object of his task in mind; and for this reason he has a right to examine the purport of the end that he is pursuing. He must ask himself whether it serves the purpose of the idea for which his labor is to be undertaken. . . . . "[8]

The scope of this difference is more far-reaching and more ramified than one is led to suppose at first blush, for it involves a number of other fundamental questions, as we shall see later, anent the rôle of the applied psychologist in the sphere of human activity.

The second flaw in the bridge analogy is even more flagrant. It is a fallacy of the day, one that follows in the wake of material success. The *idée fixe* of the successful man is efficiency at the expense of everything else, or perhaps conversely rather, the goal of the efficient man is success at all costs. The line of reasoning in his case follows some such trend as this: "I am asked to advise X about such and such a matter. X knows his business well, and it is for *him* to

[8] A. A. Roback, Psychology of Confession. *University Magazine,* April 1917. XVI., p. 265.

decide whatever he wants. I am here merely to carry out his orders. The why and the wherefore are beside the point and do not concern me." In the *intellectual* sphere such an attitude would come under the rubric of the *lazy* argument, but in practical affairs, this mode of thought is quite active and effective. School readers and primers abound in stories calculated to cultivate just this habit of mind, *i. e.*, to inculcate in the child a spirit of obedience and love of discipline, but surely the applied psychologist must have a broader outlook on life. He ought to be able to distinguish between what is *desired* and what is *desirable*, between the professional and the moral issues.

The bridge analogy is more or less plausible,—and to a great many readers it will probably sound convincing,—because here we are moving in a professional realm. The engineer must bow to the authority of the legislator or the economist, because these are experts in their field, and it happens that their field takes precedence over his, though as has been stated, the precedence is only partial. The order and relationship of the various sciences demand a certain subordination of some scientists to others. Thus the psychologist, in a measure, looks up to the physiologist; the physiologist is somewhat dependent upon the results of the chemist and the physicist; and these, in their turn, court the mathematician with his positive formulae, but this professional subordination has no real bearing on our problem. In setting the actual building machinery into operation, the engineer is not beset by the question as to whether it is *moral* for him to undertake the task, unless, of course, he should happen to be approached by the enemy of his country to further their war plans, or a similar predicament should fall to his lot. Outside of these rare cases, his task is to determine merely whether a given project is *practicable*. It is different with the applied psychologist who has also to consider the *ethical implications of his task*.

The applied psychologist has a right to ask whether the object desired will serve the social as well as the individual end, for the very reason that in ethical questions, it is fatuous to talk of professional authority. In such matters, every man is his own expert, and, therefore, is not bound to take orders from his employer unless the latter's individual aim is, at least, not incompatible with the social end.

In a sense the same problem confronts every applied scientist; and we should be in a sorry state (at least in a sorrier state than we are at present) were the inventor, the

chemist or the physicist to consider the immediate end of his task only. A suitable illustration may be had from a passage in one of Wilde's novels. We quote the impassioned appeal of Dorian Gray to his friend of former times, Alan Campbell, to destroy, by means of chemicals, the corpse of the artist that Dorian had foully murdered. In the following entreaty, it will be possible to detect, in a slight degree, the argument of the modern applied psychologist who wishes to keep the means and the end entirely apart from each other.

Says Dorian Gray:

"All I ask of you is to perform a certain scientific experiment. You go to hospitals and dead-houses, and the horrors that you do there don't affect you. If in some hideous dissecting-room or fetid laboratory you found this man lying on a leaden table with red gutters scooped out in it for the blood to flow through, you would simply look upon him as an admirable subject. You would not turn a hair. You would not believe that you were doing anything wrong. On the contrary, you would probably feel that you were benefiting the human race, or increasing the sum of knowledge in the world, or gratifying intellectual curiosity, or something of that kind. What I want you to do is merely what you have often done before." And when Campbell refuses to hear of the matter, Dorian's plea becomes more pointed. "No, don't think of that," he exclaims. "Look at the matter purely from a scientific point of view. You don't inquire where the dead things on which you experiment come from. Don't inquire now."[9]

It is scarcely necessary to go to fiction for illustrations. We have only to mention the idealism of the inventor of dynamite in founding the Nobel Institute, or the seeming inconsistency of Simon Lake, the inventor of the submarine, in publishing pacifist appeals in the form of large newspaper advertisements, while this country was on the verge of war with Germany. Inventors of the most infernal war-instruments will insist, with a certain amount of sincerity, that it was their purpose to benefit humanity by their inventions and not to contribute to its destruction. This apologetic attitude in itself is sufficient to indicate that means and ends are more or less inseparable.

It is only lately that such problems have been coming to the fore. Ethical issues have become so interwoven with the specific technological problems of the day that many of the accepted and time-honored practices of the professions are

[9] Oscar Wilde, *The Picture of Dorian Gray*, Chapter XV.

gradually falling into desuetude. We are beginning to gauge things more and more according to their *context* and less according to *tradition*. The situation as a whole, and not the individual practice, is now to be the governing factor. The office of the physician, since the days of Galen and Hippocrates, if not from time immemorial, has been invariably to cure, to prolong or to conduce to life. The twentieth century, however, has seen a more intimate connection between the medical profession and social reform movements, with the result that physicians are not guided now, as they were wont to, by that absolute maxim which seemed as inviolable as a law of nature. And though the action of the physician who chose to decide for himself the fate of the new-born cripple raised a storm of protests on all hands, the very act serves to prove that medical ethics is undergoing a great change. This is even more evident from the part physicians are playing in the birth control and similar movements, such as the sterilization of the unfit. The *right or logic* of such an alliance may be called into question, but our interest is primarily in the *fact* of such a *liaison,* showing us that the means can not be absolutely divorced from the end, as Münsterberg explicitly and other applied psychologists implicitly hold.

The applied psychologist, unlike other applied scientists, is in a somewhat peculiar position because he serves in the capacity of a go-between,—and here we come to the third point of difference between psychotechnics and other kinds of technology. The bridge that the civil engineer builds may shape the destiny of whole nations, yet it can not be said that his energy is directed, in the first instance, toward a human objective.[10] There is no interaction here between personality and personality as in the case of the applied psychologist, whose business it is to act as an intermediary between two parties, in fact, between two opposing sides. The civil engineer does not undertake to *influence anyone's mind*. His work is physical in the sense that any task can be called physical. A more subtle demand is made of the applied psychologist. He is looked upon as a medium between the salesman and the purchaser, between manufacturer and consumer, employer and employee, advertiser and reader. Theoretically speaking, his function is to bring about an understanding between the two parties concerned with the least expenditure of time and energy. In that case, we might regard him as a *mental broker* whose interest it is to serve

[10]A. A. Roback, Psychology as Applied to the Natural Sciences. This *Journal*, 1917, I., pp. 145-146.

both parties fairly. Every applied psychologist would probably agree, in theory, to this premise. Thus we repeatedly find in Münsterberg's later books the injunction that the applied psychologist must be impartial, that he must set about his task without prejudices, either economic or social. The injunction is a good one to have in mind, yet in practice it is far from being carried out. *In abstracto* the applied psychologist is in the service of humanity, in *reality* he is in the employ of the one who can pay and actually does pay for the advice and other, perhaps more practical, help he is receiving. Couch it in whatever terms we please, the applied psychologist is, under present conditions, an *agent,* not a broker. As an agent, he looks after the interests of the advertiser, the employer, the manufacturer, the salesman, etc. If this conclusion is denied, we have only to ask what applied psychology has to offer to the consumer, the employee, the purchaser, etc.

It does not require any subtlety to perceive this one-sidedness. The limitation attaching to applied psychology, though not inherent in it, has never been brought home so clearly to the present writer as on one occasion when, after delivering a talk on applied psychology to a mixed audience of radically-minded people, he was heckled by a moderately-educated Irishwoman who, in spite of her prolixity, succeeded in making her point. No one, at the time, felt more than the lecturer that his rejoinder was only a *tour de force,* that whatever benefits the workingman should reap by the efforts of psychology to perfect the industrial efficiency system, the advantage accruing to him would be only indirect, while the employer is gaining a net profit out of the psychologist's findings and management.

This phase of the story scarcely requires any amplification. Münsterberg's work in applied psychology has largely been indicted on this count; and it will be instructive to read how his *Psychologie und das Wirtschaftsleben* has fared at the hands of a German critic, who speaks in a derogatory manner of the *Amerikanistische Tendenz* which he finds in the book. In the detailed review by Willy Hellpach[11] of the German version of *Psychology and Industrial Efficiency,* the tone is somewhat more polemical than it might have been and betrays an irritated attitude on the part of the reviewer; but, making allowance for the vehemence of his criticism, it is not to be denied that Hellpach has put his finger on the weak spot

[11]Willy Hellpach, Hugo Münsterber, Psychologie und Wirtschaftsleben, usw. *Zeitschrift für angewandte Psychologie,* 1913-14. VIII., pp. 567-583.

when he says, in the course of his review: "Der Psychotechniker darf bald um die wirtschaftlichen Ziele sich kümmern, und bald hat er sie zu ignorieren. Er darf sich um sie kümmern, solange er sie billigt; solange er jenen Amerikanischen Optimismus sich bewahrt für den die wirtschaftliche Prosperität ein Selbstzweck ist, dem alle, aber auch alle anderen Rücksichten untergeordnet werden dürfen. Aber die wirtschaftlichen Ziele gehen den Psychotechniker in dem Augenblicke nichts mehr an, wo er beginnt sie zu missbilligen, an ihrere Güte zu zweifeln. Dann sinkt er in die Stelle des konsultierenden Psychologen engsten sinnes zurück; dann hat er die Probleme zu nehmen, die ihm gereicht werden, und ihre beste experimentale Lösung zu erwirken."[12]

Hellpach makes no effort to stop and consider the issues at stake. He contents himself rather with pointing out the contradictory phases of Münsterberg's various steps. In fact, in one place, he signifies his willingness to accept Münsterberg's position of subordinating applied psychology to the practical pursuits in life, provided the whole scheme works out consistently. We feel, however, that the problem is more fundamental than would appear from Hellpach's dialectic, and essentially formal, review. It is for this reason we have sought to approach the subject from an analytic angle. It is not so important to expose the contradiction as to discover its cause.

The weakness of the applied psychologist seems to be the weakness of every practitioner, and may be called the practitioner's bias,—a phenomenon most noticeable with the lawyer. It must, however, first be established whether the applied psychologist is to be considered as a mere practitioner. If we attach any value to Münsterberg's claim for applied psychology, then any department of psychotechnics is "*nicht weniger echte Wissenschaft als die theoretische Psychologie.*"[13] As a scientist, then, it is incumbent upon the applied psychologist to eliminate, as much as possible, personal motives and to serve the interests of humanity at large, rather than to align himself with one set of people against another. Yet in fairness to him, it must also be pointed out that there is more to be accomplished on the one side than on the other. It lies in the nature of things that the advertiser, the salesman or the employer is the *active* party, while the reader, the purchaser, the employee is *receptive*. The former have a *positive* business before them; the latter can only be taught how to protect themselves against the measures of the industrial

[12] *Loc. cit.*, p. 579.
[13] H. Münsterberg, *Psychotechnik*, p. 23.

and commercial officials. *Their* task can, therefore, only be a *negative* one; but even so, it need not be wholly neglected as it has been done hitherto, and, furthermore, it is desirable that discretion should be shown in catering to consulters.

If the applied psychologist never takes the trouble to inquire into the aim of his consulter, the situation would be unfortunate indeed. It is puerile to take up a legalistic attitude in such matters and to further every selfish and anti-social motive so long as the undertaking is within the bounds of the law. The psychologist knows that an advertisement with a sexual setting will enhance its force of appeal, yet such information, in the opinion of the writer, is not to be spread broadcast among advertisers, though not a few of them are their own psychologists in a practical way. There are no keener applied psychologists than the newspaper men in this country with their formidable headlines, amplified sensations, silly cartoons and infantile "funny pictures." If success counts, they must be congratulated on their achievement in stultifying the masses; yet what should we think of the applied psychologist who, on being asked how to increase the circulation of a newspaper, should put those means at the disposal of the questioner?

No connivance on the part of a consulting psychologist can be justified on the ground that applied psychology is an *instrumental science* and is, therefore, not concerned with ends. If we choose to accept this professional view, we shall be involved in no end of difficulties. As no purpose is ultimate, or absolute, there will be a tendency to rule out all ends and to ignore every consideration but what is expedient. The applied psychologist would then be reduced to the part of a Figaro, who manages to steer clear of all scruples, so long as he is compensated for his services. We should hope to see a brighter future for the applied psychologist than to be placed on the same level with the factotum barber of former times.

Applied Psychology in the Future

We have pointed out the chief limitation of present-day applied psychology. It would, however, be erroneous to suppose that the whole department is to be discarded because of this defect. As a matter of fact, the defect has arisen out of a misconception.

The conclusion has been reached that applied psychology has no voice in *defining and determining ends*,—which is a perfectly valid inference, considering the nature of applied

science in general,—and forthwith it is assumed that applied psychology has no concern whatever in the purpose of the end to be attained. This transition from an obvious fact to an unproven assumption is manifestly unwarranted. We must surely realize that there is a difference between the *positive* operation of *determining an end* and the *negative* task of *checking it up*. Not only has the applied psychologist a right to examine the project that is laid before him, but he is in duty bound to do so.

Applied psychology is still in the stage prior to *mitosis*. When the division does take place, there will emerge two types of applied psychologists, each with a different function. The time is not yet ripe for a thorough organization and specialization of the whole field. It is inevitable that the two attitudes should conflict in that department for the reason that the territory has not yet been divided. It will not take long, however, before we shall see *an army of consulting psychologists* looking up towards the theoretical discussions of the *few general applied psychologists,* whose main office it will be to direct the profession along scientific and moral standards.

At the present time, we are in the process of building up an ethics of applied psychology. Naturally this line of work can not go on *pari passu* with the technological part proper, because we are dependent for the moral issues on the actual problems set us. The same is true of other branches of human endeavor. Legal ethics is a comparatively late development; and those who were responsible for its creation were not practising attorneys, but jurists who viewed the everyday cases in a philosophical light and treated them systematically as a connected whole. The practitioner precedes the jurist in practice, but the latter takes precedence over the former as to final authority.

The fact that there are such things as business ethics and legal ethics, in spite of the proverbial unscrupulousness of merchants and lawyers, should make us see what we have to expect of further developments in applied psychology. To be sure, there will always be a number of individuals who would not even attempt to rid themselves of the practitioner's bias. The total separation of means and end would impress them as the very course to follow, but as this field of psychology advances, there will always be enough theoreticians to expose that weakness and to demand a certain autonomy for the consulting psychologist.

Since applied psychology is still in its swaddling clothes, we need not be surprised at its being treated by means of ana-

logies. The mistake of one of its nurses will not thwart its normal development.

In the social sciences, it is the *point of view as a whole* that undergoes a change rather than the particular theories and hypotheses. Much of Ricardo's economic theory, for instance, is still sound, but it is the new setting of the Austrian school that represents the great advance of political economy in recent years. Similarly the jurisprudence of the days of Austin and Maine is of a different texture from the brand elaborated by Jhering. The whole subject now presents an entirely different aspect with which the great British jurists could not have been familiar in their day. May we not predict a similar change of viewpoint in the case of applied psychology, in so far as it is a social science?

PRACTICAL APPLICATIONS OF PSYCHOLOGY IN THE TREATMENT OF CERTAIN PSYCHOPATHICS (AND OTHER NEUROPATHOLOGIES)[1]

By A. W. Trettien, Toledo University, Ohio.

When your President did me the honor to invite me to address this body to-night, he suggested that the topic relating to Psychology and Psychopathics would be appropriate and acceptable. Your interests are essentially medical. Mine are psychological and educational. Hence my subject: Practical Applications of Psychology in the Treatment of Certain Psychopathics (and other Neuropathologies).

In discussing this essentially technical subject I shall treat it from the standpoint of a psychologist and set forth as clearly as I can the fundamental psychological principles involved, and let you make such medical deductions as you may.

Since coming to Toledo I have been interrogated regarding the phenomena of hypnotism, mesmerism, magnetism, spiritism, clairvoyancy, mind-cure, spiritualism, thought-transference, fortune telling, Christian Science, phrenology and a host of other allied interests. Now all of these are without doubt legitimate matters of psychological inquiry; but these inquiries suggest the index by which the psychologist may judge the present status of the popular notions of psychological speculation. To many persons who are otherwise very thoughtful and intelligent, psychology has not yet risen out of the vague fog of medieval mysticism. It is the business of the psychologist to analyze the phenomena involved, clear away the chaff of superstition and carefully garner the truth of the soul's experiences.

Psychology has passed from the mystical, purposive abstractions to a new day of the study of causal relations. The psychological laboratory has been established with its varied equipment, for the most subtle analysis and explanatory investigation of the mind's phenomena. With the laboratory there came the experimental method and technique. It began with the simplest experiments on sensations and impulses. The higher psychic states however seemed to defy the experimental method. But just as in the physical sciences the most complex

[1]Read before the Toledo Academy of Medicine, Feb. 2, 1917.

phenomena have yielded to the experimental method, so the higher and more complex phases of the mind's experiences have been conquered one by one—memory, imagination, association, feeling, judgment, emotion, phobia and inhibition—all have become subjected to the scientific methods and are yielding rich fruits to science.

But our modern age is a practical age, and psychology is responding to its needs. This new psychology, if it may thus be designated, is rich in its possibilities of application to our life's problems, wherever the human element is a factor. Hence we speak of the psychology of memory, attention, business, crime, pathology, fatigue, fine art, religion, etc.

The physician is a man of science. But he is more. He must also be able to apply the results of science to the prevention and relief of human ills. He has but one aim, namely —the health of the patient. To secure this end he summons the contributions of the various sciences—chemistry, biology, physiology, and physics for both diagnostic as well as therapeutic purposes. And now, what has psychology to offer for the relieving of human ills?

In the first place, modern psychology has established a new relationship between body and mind. As a matter of course, mind and body are interrelated wherever action is performed, whatever may be our philosophical theory. Physical changes are accompanied by psychical changes. " There is no neurosis without its accompanying psychosis " is a well established law. A disturbed liver produces melancholia. A wholesome metabolism produces an optimistic mind. An affected thyroid gland produces a disturbed mental state. On the other hand, the converse is true. "There is no psychosis without its accompanying neurosis." The whole muscular apparatus is set into motion by a mental state. A picture upon the screen may make the cheek blush or turn pale, which means that the large groups of blood vessels have become dilated or contracted due to the impulse from the vaso-motor nerve fibers. The action of the heart changes, the lacrimal glands overflow and fill the eye with tears. In a state of concentrated attention, which means, physiologically speaking, muscle tension, the posture of the body is changed, respiration, circulation, digestion and excretion are all more or less affected. The imagination may directly stimulate the secretions of both the ductless and the duct glands.

Experiments conducted upon rabbits and other animals show conclusively that fear and fright does have a direct influence upon physical growth and development. When the animals

were kept in a constant fright it affected the functioning of the glands, changing the chemical processes of the body so as to prevent normal development. Observations upon school children go to show that fear of punishment, of examinations, of teacher or school-mates interferes with health. Laboratory experiments show that the slightest feeling may have its influence upon the pulse, respiration, digestion, glands and circulation. That thoughts give impulse to nerves that enervate the muscles.

In a word, any or all of these disturbances whether of physical or psychical origin produced changes of a physical or a chemical character that tend to disintegrate or reconstruct the tissues. Some of these changes are, in our present state of knowledge, irreparable. Some possibly may be restored by physical or chemical agencies like drugs or electricity; others may be affected by physiological or neural stimulations as in the case of osteopathy; still others by an appeal to the special sensory centers and muscular manipulation. The so called "cure" is effected in each by aiding nature's processes of metabolism. But there are other changes that may be stimulated by psychical impulses which affect directly the physiological functions as truly as a bath, an electric current or an opiate. In either case the effect upon the nerve cell is either to stimulate or to inhibit the functional processes of the organism. Modern observations and experiments in every field of psychology verify Seguin's law stated a half century ago, namely —to exercise an organism develops its function; to stimulate the function develops the structure of the organism.

Without doubt nine-tenths of the organic troubles of the race would be prevented or remedied if man responded intelligently to this simple law of hygienic living. In a simple statement the sensations, feelings, pain and pleasures and rational thought itself are the re-actions of the physical and psychical to warn, to invite, to lead the way to health and good fellowship in a world of constant flux. He who runs may read and take warning; or he must pay the doctor's bills. The ailments in which the average practicing physician applies his common sense psychology are too numerous to rehearse. Rapid progress is being made in our general educational campaign on health that is destined to make for human betterment.

The second rôle which psychology is playing today is that of a diagnostic function in certain neural disturbances. Modern psychology is a biological science; and as such the principles of a genetic psychology have developed contemporaneously with the theory of biological evolution and the

unfolding of a comparative neurology. The tracings in the development of the nervous system parallel organic evolution from the lowest to the highest forms. In the simpler undifferentiated tissues of the lower forms of life there is a direct response to the stimulations from the world without; with higher organization of function and increasing differentiation the sympathic and the central nervous organization takes form up to man where the brain is *par excellence* the organ of co-ordinating functions. The psychical processes arise and become an integral factor in the reaction of groups of cells that function as ganglia.

This psychical element may either inhibit or re-enforce the original impulse. And all along the line of development every species of the race has left its contributions in ganglionic organizations in the struggle of life and death, in binding together those vital organs that may best sustain such groups of co-ordinating muscles as will succeed in doing the world's work. The work of Gall and Burdach in tracing these nerve tracts, of Forel and Nissl in showing the effect of severing nerve tracts, of Hughlings Jackson in formulating his three level theory of nerve functionings in the cord and brain, of Flechsig and Meynert in establishing the functions of different areas in the cerebral cortex; and later work by Kolliker, by Cajal and scores of others like Meyer, and Kraepelin has paved the way for the group of genetic psychologists like Hall, Jung, Freud and their schools, which are tracing the reactions of various ganglionic groups in the appearance of different psychical impulses, instincts, feelings, emotions, sensations and the higher forms of mental, emotional and volitional complexes as they appear in the process of mental evolution. And with the aid of the psychiatrist they are teaching the nature and causes of mental arrests as well as the processes of deterioration as they occur in the various forms of psychopathology and neuropathology. Practically all of this most remarkable chapter of science has been written by the generation of men now just closing their life work. How are we applying this rich fruitage to relieve human ills?

These studies have thrown considerable light upon etiology as based upon the genetic viewpoint. From them we get three quite distinct neuropathic periods. The period of infancy, to the age of three or four; the period of childhood, to the age of ten; and the adolescent period. Each period is fraught with dangers quite distinct from the others.

First, the period of infancy is subject to nervous disorders in the form of convulsive seizures, paralyses, idiocy, imbecility,

due so far as our present knowledge reveals to an unbalanced or defective development of the sympathetic nervous system, the cord and brain; the causes have been traced to predispositions, malnutrition, toxins, diseases and sudden nerve shocks that either exhaust the cells or produce an unbalanced condition between the motor and the inhibitory powers of the brain. If these maladies attack the fundamental or basal ganglia they usually interfere with the growth and development of the higher association centers that affect the intellectual and emotional life.

What can psychology do to cure these forms of neural disturbance? Directly, to the afflicted patient, it can accomplish nothing except through Seguin's law—by a stimulation of effort and function to structure. Little is yet being accomplished in profound attacks. Indirectly, in the matter of tracing causes and organizing an educational campaign of prevention, psychology is rendering important service. It can further assist in psychological diagnostics by placing responsibility for proper legislation for social and race betterment. Psychology can also suggest a course of training that may conserve and develop every power of the patient to the fullest and best of which it is capable.

During the second period, the period of childhood, the body is undergoing a series of changes that in a peculiar way tax the central nervous system and cause neuroses peculiar to this period. This is the age of second dentition, and digestive impairment is common. It is called the age of anemia. Dr. Hertel's studies go to show that in girls the percentage of sickness rises rapidly from the first to the third year of school life. He concludes that "we must put aside all illusions and confess that the present generation of young girls is weakly, anemic and nervous to an extraordinary degree." In the development of the nervous system the child is passing from the sensory to the motor period of life. The accessory motor centers of the brain are functioning more or less independently in accordance with the race tendencies;—hence many independent automatisms make their appearance. More than one hundred and twenty-five different forms of these have been counted. Most of these have to do with the face and hands because these centers are most highly developed; they may, however, involve the entire motor system.

These forms of neuroses among children are known in medical literature as chorea. Chorea is a functional disease which is characterized by irregular, involuntary twitchings of groups of muscles. These irregular choreaform twitchings

are the outward signs of an unstable and incomplete cerebral development.

Psychology can assist in a proper diagnosis of these various forms of chorea, it can distinguish those forms which manifest a depleted vitality, requiring the rest and free play treatment, from those which are of functional incoördinations requiring training and direction through organized habits of application by bringing together the coördinations of the fundamental and accessory centers. These incoördinations are the roots upon which all specialized motor training must be grafted. During this motor period the effects of infantile cerebral paralysis become peculiarly apparent. The paralysis is the result of a cerebral lesion which cannot be removed by any therapeutic measures. Hope is expressed that good results may be obtained by orthopedic appliances and by tendon-transplantation. Psychology is just beginning to apply itself to the re-establishment of function through the process of re-education. This process rests upon the principle laid down by Seguin and gives much promise of good results.

The third period—adolescence—is the age that is peculiarly susceptible to the various forms of psycho- and neuro-pathologies. In consequence of the process of physical and chemical reconstruction the nervous system is put to the test in a peculiar way. New demands are made by the digestive organs; and these give rise to digestive disturbances which manifest themselves in distorted appetites, constipation, and flatulency. The heart, in order to meet these demands, may double its size, giving rise to cardiac disturbances of palpitation and nervous flutter; while the composition of the blood often produces a chlorotic condition. These changes tend to produce irritability, inertia and a nerve tension that causes in the adolescent an oversensitiveness of the psychic.

With the influx of new instincts and impulses wholly unknown to the youth before he becomes morbidly conscious of every physical process, he counts his pulse beats, and feels their irregularities, and as a consequence he develops a "cardophobia." With digestive disturbances there appear dermal eruptions, muddy complexions and various forms of skin disease. These also add to his already supersensitive nature. Adolescence is undoubtedly the age of incubation for many grave afflictions, "so that the germs of death are now taking root," as Dr. Hall says, "like tares among the forces of the budding, vernal life." Medical literature in the past has neglected the dangers of this most important period of human life.

An index of the demands made upon the nervous system may be seen in the nature and varieties of neural as well as psychical disturbances. From the extreme form of " ideoglassia," in which the person speaks in his own strange tongue, to the more common forms of stuttering we have illustrations of nerve incoördination. Before articulate speech is possible the higher cerebral centers must grip by the process of developmental coördination the sympathetics with the special ganglia and the brain centers that control the manifold musculatures of the speech centers—both sensory and motor—respiratory, laryngeal, glossal, facial; in fact the entire being, for the time being, functions in conscious speech control, and then reduce all again to the realms of the subconscious. Let any one of these centers play false and pandemonium reigns—in the form of psychical confusion and incoördination in which glands, organs and systems fully participate; and thought, feelings and emotions, muscle and neural deterioration, indigestion, chorea, and spasms may be the result. Psychology can analyze and stimulate through nature's batteries of the cerebral cortex those centers of muscle, thought and emotions that require stimulation and suppress those that require inhibition and thus restore the proper balance—controlled speech. These are functional impairments that no chemical or electrical stimulation will affect.

Epilepsy is a disease that has been discussed since ancient times,—both in medical literature and in Holy Writ. The term epilepsy generally suggests nerve spasms, violent seizures, idiocy and imbecility—a conflict between the deeper reflexes and the higher neural and psychical processes. An epileptic may belong to the lower strata of development; but there is also the ideopathic epileptic who may rise to the plane of a college graduate—these latter forms including the so-called reflex convulsions due to an unbalanced nerve functioning brought on by injuries, and by excesses of various kinds, drugs, opiates, great emotional disturbances and the like, which produce profound fatigue. Certain basal ganglia or reflex centers gain the ascendency over the cerebral processes. By means of suggestion and psychoanalysis psychology can inhibit, stimulate or reinforce the dormant centers and thus re-establish the normal reaction.

Hysteria may be described as a defect of will power and an excess of emotional excitation, including the hysterical mania in children or acute mania of the adolescent period; this disorder lends itself readily to psychological treatment. The nerve discharge may be re-directed into other channels; and

the irritable, excitable, sleepless, crying, laughing, confused delirium may by this means be transformed into a calm, self-controlled, rational state. In this same group may be placed many of the phobias, which persist as emotional complexes and attacks. These appear in the post-adolescent years, especially in women; and they tend to make life a burden to the patient and his family. Many physical ills are caused by fear of darkness, of burglars, of cats, of growing old, of being unpopular, of unpleasant companions, of irksome work, of remaining single, of child birth, of inconstancy and by a countless thousand other fears which cause worry and insomnia, and which drain the cup of life to the dregs prematurely. Psychology can break up these emotional complexes, can remove the vestigial core, and can permit the psychic wound to heal, giving rise to a personality that is not rent in twain by conflicting motives.

These are but instances in the realms of everyday experience; others might be reported. From these it is apparent that consciousness is a potent factor in human history, and that applied psychology has an important service to perform in the evolution of the race.

Case 1. Young man, H. H., aged 21; voice did not change at the adolescence period; voice in high, nervous and uncontrolled pitch. His affliction was of great annoyance to him as he is a student in the university and has professional ambitions. The affliction is said to be due to a cold and a nervous throat trouble which occurred during the adolescent period; it has been diagnosed as "a congenital insufficiency of vocal cords," whatever that may mean. Chemical treatment by means of drugs, electrical stimulation, and mechanical manipulation were without effect. His was a functional disorder due to a psychical and neural cause. The vocal cords were examined and found to be normal in structure. The nerve tension was released, the conscious voluntary centers of the brain were incited to control the correct processes and submerged below the threshold of consciousness, and in this manner the normal function was established.

Many cases of speech disorders are of this nature of nerve incoördination—functional—and can be treated successfully only by proper psychological methods, either by suggestion or by psychoanalysis.

Case 2. A boy, B. C., thirteen years old; at school he was rebuked by his teacher; he refused to speak, became stubborn and for several months remained a silent member of the class. He was brought to the child clinic on October 5th, last. A physical examination revealed no abnormal conditions. His

nerve reactions were normal and his motor control was good. All of the psychical processes,—perception, memory, imagination, association and judgment—were developing in a normal manner. His inhibitions were abnormally strong.

Several questions of a personal nature were put to him sharply when he turned pale. His hands began to tremble; his mouth became dry; his tongue clung to his palate; and he swallowed incessantly. His pulse increased, and he became mute. Employing suggestion and psychoanalysis we began a process of re-education extending over several weeks, with the result that the lad appeared before a section of the Northwestern Ohio Teachers' Association during the latter part of October and spoke to that body without embarrassment for several minutes. He is now quite master of himself.

This type of case is very common in all walks of life, especially among growing children where the process of functional development and nerve control is incomplete. Suggestion, control, and direction of attention in establishing definite habits of reaction will prevent these disorders; these measures may bring about a permanent cure if taken in time.

WHAT CAN THE PSYCHOLOGY OF INTERESTS, MOTIVES, AND CHARACTER CONTRIBUTE TO VOCATIONAL GUIDANCE?[1]

By Joseph K. Folsom.

In this paper I shall endeavor to discuss some by-products of recent psychological reflection and research in so far as they relate to vocational guidance. It is not expected that these will be of more than suggestive value. "What Can Psychology Contribute to Vocational Guidance?" would be a theme for a volume. It would include all the applications of mental tests of all kinds, tests of skill, etc., to vocational problems. But there is a field within the province of psychology which, compared with this field of intellectual tests, etc., has been given slight attention in a really scientific way, but which may prove to be as important if not more so than any other. This is the psychology of interests, motives, sentiments, emotions, will—what is often called the "character" side of mental life as distinguished from the "intellectual." It is not necessary to explain in detail the nature of this distinction—which is an important one even though we have given up the old idea of separate departments of "faculties" of mind. Roughly, for our purpose, the one field includes the various habits of manipulation (skill), language and other symbolic habits (intelligence), and of sensory impression, all of which habits are of significance not as individual habits, but through the *abilities* which result from them, which can be measured by tests. The other field, which is our present subject of discussion, includes the emotional reactions, among them satisfaction and annoyance, with their connections to various stimuli. What is of significance here is not so much measureable *abilities* resulting from them, but the *habits* themselves—that is, the strength of the various emotional reactions and the nature of the *stimuli* to which they have become attached.

This domain has been largely the prey of pseudo-science, and whoever enters it puts his activities therein in great

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danger of being colored by a suspicious and unscientific flavor. Nevertheless, although phrenologists have made character traits separate departments of mind, revealing themselves in "bumps" on the skull, although amateur psychologists of the business world compile long lists of character qualities without meaning or defined purpose, although pseudo-scientific formulas for reading character on the basis of crude analogies and undemonstrated correlations are spread abroad and commercialized; still this is a legitimate field for really scientific consideration.

(1) My first suggestion is that the objective or behavioristic view of human nature be taught to vocational scientists and that they be encouraged to think in these terms. By this I mean, practically speaking, that the fundamental terms or units in which human character must be conceived, are *stimulus* and *response,* and not ideas or sentiments or images or any bits of "mental content" or "mental stuff" or "data of consciousness." By this I do not mean that these subjective terms are not to be used at all, but that when used they are to be recognized for what they are, —i. e., simply names for various types of *relationship* which we observe or infer between stimuli and responses and the environment, and *not* as the ultimate data of a psychic world order distinct from the physical world. At present I cannot say specifically just how this difference of philosophical conception would make a difference in the practical efficiency of vocational guidance, but if clearer and more rational conceptions are ever agents of improvement, we need not doubt their value here. I can easily point out how the objective conceptions would seem very likely to facilitate other conceptions that would solve vocational problems more efficiently. The beneficial effects would be mainly indirect, but none the less important.

(2) Growing out of this is the problem of *character qualities.* The first impulse in attempts to tabulate human nature for vocational purposes is to make out a great list of qualities. Many employment systems demand that the individual be rated in dozens of these traits, listed like physical measurements. The trouble with this method as it is usually used is, first, that the conception of "qualities of character" is misleading. It is static and should be dynamic. A man does not "possess" so much honesty and justice and conscientiousness and leadership in the sense that he "possesses" a head and two arms or a 36-inch chest circumference, but these adjectives are to be thought of as naming characteristics of his *behavior* and its *stimuli.*

Second, these trait lists could be handled with more intelligence if they were properly distinguished according to the *kind* of relationship designated. Thus traits fall into two groups, (1) those that designate kinds of *behavior,* and (2) those that designate the *stimuli* to which many kinds of behavior are attached. Under (1) would come energy, kindness, aggressiveness, cheerfulness; while under (2) would come patriotism, loyalty, honor, justice, morality,—what are called "sentiments." If this distinction were borne in mind, traits would be more intelligently used and interpreted, with regard to their origin, permanence, and vocational significance.

A third trouble with these traits is that they fail to discriminate between different situations, and they assume too great generality. A man may be very aggressive in familiar situations, but timid in strange surroundings. Lack of concentration may be simply inability to cencentrate on certain kinds of work. The most cheerful individual in the office when things go right may be the ugliest when things go wrong.

To obviate this difficulty several methods might be used. One is to specify on these character blank forms all the more important and critical situations which come up in the occupational daily life and record the individual's reaction to each. Schematically, the question would be put: How does A, as compared with other individuals, react to the following situations?—Then follow a list of situations and stimuli such as: being alone, noise, being criticised by a superior, outdoors, close confinement, mechanical detail, dirt, dangerous tools, carelessness of inferiors, etc. Such a list could easily be devised to represent the most important situation-elements in any vocation or in vocations in general. Dean Schneider has well recognized this principle in his list of characteristics of men and jobs. Several of his traits, such as settled vs. roving, indoor vs. outdoor, directive vs. dependent, small scope vs. large scope, belong to this category, i. e., they refer to *stimuli* rather than to general qualities of behavior.

This matter is wonderfully clarified by the principle of the conditioned reflex, a concept developed in studies of animal behavior, and in terms of which the behaviorists would explain all human learning and the development of character. Briefly, it is this. If when a dog is fed a bell is always sounded within his hearing, after some repetitions the sound of the bell alone, without the food, will produce secretion of saliva, although previously it was a perfectly indifferent stimulus to the animal. The secretion is an original reflex act as provoked by the original stimulus of food tasting; but as

produced by the bell it is an acquired or conditioned reflex, the bell being called the conditioned stimulus. The two stimuli have become associated through their being presented together many times. Now the same principle governs all our reactions, those that are called thinking and feeling as well as secreting saliva. A man may come to loathe indoor work because some past condition which produced illness was associated with indoor environment, not because of any general quality of "restlessness" or what not. A man may resent criticism so severely that his vocational efficiency is impaired, not from any general quality of independence or "know-it-all-ishness" but because of some childhood experiences. The effects of noise, fatigue and environment upon the worker, which also have been well discussed by Dean Schneider, and the general "energizing" effect, as he calls it, of various occupations, is partly a matter of these conditioned reflexes rather than of generic traits. It may well be remarked that all this does not teach a good practical observer of human nature anything that he doesn't know already, but I would answer that it will be apt to make him pay more attention to some of these things he knows, with resulting profit in analysis and judgment.

Another possible method of recording character would be to *specify* the *reactions* and inquire as to the stimuli. Thus, might be asked: In what situations is A cheerful, in what situations depressed, what stimuli make him angry, bashful, enthusiastic, indifferent, etc.? I have asked the question of 155 men, "What situations arouse in you the most anger or irritation?" and I found that the most numerously represented group of stimuli in the answers so far analyzed (73) consists of various forms of self-assertive and doimneering behavior of other persons, such as egotism, bullying, insults, ridicule, etc. It is possible that useful information of this kind might be gotten from self analysis supplemented by the observations of others that might be of real value in selecting jobs and job-holders.

A still better method would be to ask for a free and detailed description of the individual's habits, specifying the general respects in which analysis is desired, such as the general heads leadership, energy, adaptability, intellect, efficiency, etc., but leaving the particular stimuli and reactions both to be described by the individual himself or his judges (preferably both). In doing this the scheme of F. L. Wells (Psy. Rev. 21:295) might well be followed, adapting it to the particular purpose. In this way information more specific

and hence more valuable would be secured than from any cut and dried list of items made up a priori. A useful variation of this method would be to ask, "List the respects in which A is superior to the average, and the respects in which he is inferior. What are his most noticeable characteristics?" Information of the kinds suggested here is commonly obtained in letters of recommendation, etc., and the method of getting it could be standardized. The best results are probably to be obtained by using a method which calls for some standardized judgments, and some free answers which give leeway to describe individual peculiarities that cannot be standardized. Many of the most important characteristics of individuals for vocational efficiency are such as cannot be described in one word or a few words, but must be described as certain well specified reactions to certain well specified stimuli.

That the stimuli cannot be too well specified is illustrated by the following personal case: One of the students in reply to my questionnaire stated that the "quiet regular life" was the foremost motive for his choice of vocation (teaching). This suggested that we might have here a fairly definite stimulus-element on the basis of which individuals could be classified for vocational purposes: those who like quiet regularity and those who like adventurous irregularity. Certainly this seems a fundamental distinction. To test its validity for persons, I made the nearest and easiest observation possible—on myself. A little introspection showed that both motives, the desire for quiet regularity and the desire for great excitement and irregularity, are equally strong in me and each has dominated some of my activities for a considerable period. I like a quiet regular life in the sense that I do not like uncertainties and I do not like a conflict of interests; that is, I like to do one thing at a time and do it well and above all not be compelled to think about anything else while I am doing it. On the other hand, I like an irregular adventurous life in the sense that in this work itself, or closely related to it, there must be great intensity and variety of stimulation—movement, continual progress, varied social contacts, travel, energetic activity physical and mental, new and unusual experiences. Thus it would seem that this desire for a quiet regular life may be one or both of at least two distinct and independent things: one the love of concentration and dislike of gambling, chance-taking, and uncertainty; the other, the ability to get along without great variety and intensity of stimulation. The experience of others might break up these elements into still smaller elements. Thus no doubt, most any of us enjoy

some routine which we call "interesting," and dislike "uninteresting" routine. Sometimes I feel that the best way to describe any one's character is to say that "he likes what he does like and dislikes those things which he really does dislike." We hope, however, for improvement upon this.

(3) These considerations throw light on the value of photographs for selection of applicants. Experiments by Cogan and Hollingworth show that the correlations between character traits as judged by associates and the same trait as judged from photographs by any one judge selected at random is exceedingly low, although the correlation with the average of many judges of the pictures is better. It is barely possible, however, that the photograph might prove to be much more valuable than these figures show, because it seems often to indicate individual characteristics which cannot be described in terms of definable traits. As Hollingworth observes in his discussion of physiognomy, (Vocational Psychology p. 34) there are several ways in which facial features may be related to actual behavior. One of these is that facial lines may register emotional habits which have been formed. Another is that the reactions of other persons may tend to produce in an individual the traits which are expected of him by virtue of traditional associations with appearance. In selecting persons for occupations in which success depends upon ability to handle persons rather than things, certainly appearances have great influence irrespective of any behavior traits they are supposed to indicate. For such occupations the customary practice of judging from photographs certainly has this in its favor. Harrington Emerson has used this method to eliminate the greater number of applicants for positions, with satisfaction. It is impossible to say just what its value is.

(4) I shall summarize briefly some data concerning the motives of vocational choice. These were obtained from two questionnaire studies made by me, one upon 206 distinguished men of America (taken from Who's Who), and the other upon 155 upperclassmen of a small college (the entire two upper classes). The questions put to the students were: "What is your intended vocation? If not decided yet, what is the difficulty, and what possible lines of work are you considering? Please mention briefly, *in the order of their importance,* the chief motives for your choice. If your choice is not your real preference, what would you most like to do?" The eminent men were asked, among other vocational questions, "Chief motives influencing final choice."

The motives of vocational choice, as reported in the

answers to the questions, seem very similarly distributed among these students and among these eminent men who were in college thirty years ago.

The following classification of these motives seems to come very naturally, and from both sets of data. They are designated as follows:

Int.—Interest, liking, or preference for the work for its own sake.
Adv.—Advantages accompanying the occupation but not intrinsic to it, such as outdoor life, independence, liking to be in command.
Amb.—Ambition, desire for influence, power, or success.
Soc.—Desire for social contacts of various kinds.
Ser.—Service to humanity or community.
Duty—A call, sense of duty, etc.
Fit.—Belief in one's fitness or experience for the work.
Opp.—Opportunity to enter the work or succeed in it, general or specific, "big field."
Fin.—Financial motive—money, profit.
Nec.—Necessity, usually for financial reasons.
Inf.—Influence of parents or friends.
Tra.—Tradition—" It was expected of me," " Always planned for it," a tradition in family.
Elim.—Elimination—This seemed the only thing left after giving reasons against other occupations.

I believe most all choices could be brought under these rubrics.

Since the number of cases for any specific occupation is small, the only very reliable results that I can get from my data are obtained by grouping the occupations under the few large heads shown below. This grouping is not a temporary whim or makeshift, but is related to one of the chief things I have been interested in studying, namely, the psychological differences between men of technical, impersonal interests, and those of relatively human, personal interests. With the students, agriculture is set by itself, as a somewhat special and significant vocation. It is one of the most popular of the technical courses at this college.

Each student gives from one to five of these several motives for his choice. In the table are given the frequencies of mention of these several motives for each occupational group and for the whole; the same for the eminent men. Each mention scores one point for that motive, with these exceptions: The first motive mentioned, if more than one are given, scores 2 points, and if it is the only one mentioned it

scores 3 points. The answers of the eminent men were weighted in a somewhat similar manner.

The 13 motives were reduced by combining similar ones to 8 categories as given below in the table.

Percentages of various groups of motives of the total number (weighted) of motives mentioned by 155 students and 200 eminent men for their vocational choice		Total		Human occupations		Technical occupations		Eminent men (aesthetic)	Students (agricultural)	Actual total number of mentions (weighted) for students
		Em. men	Students	Em. men	Students	Em. men	Students			
Intrinsic interest	Int.	47.3	45.9	22.0	38.5	61.0	55.0	90.0	37.8	194
Satisfaction not intrinsic	Adv. and Amb. and Soc.	13.6	18.4	22.8	15.0	8.0	8.8	.....	44.5	78
Moral motives	Ser. and Duty	8.6	9.2	16.1	19.9	3.4	5.2	.....	1.1	39
Fitness	Fit.	2.1	7.1	2.0	7.9	1.3	6.1	5.0	2.2	30
Opportunity-field	Opp.	7.1	8.5	8.7	3.6	7.4	13.0	.....	6.7	36
Financial	Fin. and Nec.	8.2	5.4	10.7	9.3	6.7	2.6	5.0	5.6	23
Influence or tradition	Inf. and Tra.	5.6	4.3	6.0	2.9	5.4	6.7	.....	1.1	18
Elimination	Elim.	8.0	1.2	11.4	2.9	6.7	.....	.....	1.1	5
		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	423

STUDENTS—OCCUPATIONAL DISTRIBUTION

Vocations chosen	No.	%
Ministry	11	7.1
Law	7	4.5
Teaching	13	8.4
Business	13	8.4
Journalism and advertising	2	1.2
Other	1	0.6

	No.	%
Human	47	30.3

STUDENTS—OCCUPATIONAL DISTRIBUTION—*Continued*

Agricultural	28	18.0	Agricultural	28	18.0
Medicine	12	7.7			
Engineering, chemistry and other technical	49	31.6	Technical	61	39.4
Undecided	19	12.3	Undecided	19	12.3
	155	100.0		155	100.0

The eminent men who responded were classified as to occupation so as to agree with the above, as follows:

Human	Clergymen Professors of education Business—financiers Lawyers and judges Editors Actors School executives
Technical	Physicians Chemists Architects Electrical engineers
Aesthetic	Musicians Artists

The men questioned were arbitrarily selected to represent certain occupations typical of the human, technical, and other groups.

We cannot put too much faith in these figures but they are suggestive. A crude comparison between the students as a whole and the eminent men as a whole would hardly be just, because of the somewhat different vocational makeup and method of selection of the two groups, the slight difference in the questions asked and the manner of treating the answers, and the different viewpoint of a successful man of 50 from that of a student of 22. But if we note the differences common to technical and non-technical groups alike, we observe that the older men seemed more motivated by financial reasons and the method of elimination, and the students by service and belief in their fitness. This may be only a difference in viewpoint and frankness. On the whole, the agreement between the results of the eminent men and the students is very satisfying. That nearly half of the motivation for vocational choice among college men is sheer liking or interest for the work seems established. It is evident that this motive plays a much greater part in technical and scientific occupations. On the other hand, law, teaching and the ministry are

more apt to be chosen for some less intrinsic satisfactions, such as social contacts, desire for leadership; and for service or for financial reasons. Even if the extrinsic satisfactions are added to the interest motives, on the theory that their distinction from the latter is merely due to the way occupations are conventionally thought of, the technical men still excel in motivation by liking and satisfaction.

With the agricultural students the distinction between liking for the work itself and for its accompanying advantages is especially hard to make, the latter including love of outdoors, of nature, "like to be near animals," health, etc. If we combine all these under interest, we find that the agricultural group is superior to all the others in this motivation, except the eminent artists and musicians, who proverbially are motivated almost entirely by liking for their work.

The superiority of the non-technical students over the older men of the same kind of occupations in interest motives seems to suggest that we are approaching an era in which the conception of these vocations will be changed—so that the ministry, teaching, law, etc., will be thought of more and more as scientific, expert occupations, into which men will enter because of sheer love of the work, and less from indirect motives.

Under the technical occupations, which here include medicine, civil, electrical and mechanical engineering, chemistry and ceramics; and also in the agricultural group to some extent, the students are influenced much by belief that "there's a good field for this kind of work." This belief is probably derived largely from hearsay. It illustrates one of the main points of service for vocational guidance. Another noticeable thing is the stock evaluation of the advantages of different occupations, such as the ministry for service, business for opportunities and success, and agriculture for health, outdoors and independence. Another point that ought to be investigated is parental imitation in choice. Although my cases are too few to establish anything, they suggest, and common experience suggests, that there is a greater tendency for son to follow father in the medical profession than in any other profession.

(5) The psychology of interests and motives reveals two seemingly opposite principles. One is the permanence of interests, as shown by a statistical study by Professor Thorndike (Pop. Sci. Mo., 1912, Nov. Also in "Readings in Vocational Guidance"), and Kent's "Constructive Interests of Children." The other is the principle that the same general interest may be satisfied equally well by a great variety of

possible vocations. Any one vocation, such as that of the business executive, furnishes elements that would satisfy men of a wide variety of desires and motives. Unless the individual possesses certain habits of feeling, i. e., conditioned-reflexes, that limit greatly his sphere of possible satisfaction, both he and the job are exceeding flexible.

(6) We have seen that motives and sentiments are very real things and worth studying, but they are exceedingly illusory, inconsistent and misleading. Our emotions and sentiments are safe guides only in so far as they are anchored to the rock of *knowledge*. It is intelligence that clarifies. Half of the traditional notions about the satisfactions and advantages of various occupations, and the various sentimental attitudes toward them, melt like mist in the light of accurate information. The function of vocational guidance has been sadly misconceived. Reasoning from analogy with the "natural sciences" and arts like chemistry and engineering, it is supposed likewise that vocational science puts in the hands of experts knowledge by which they can direct and control the material in their hands, i. e., fit men to jobs on the basis of their abilities and interests. But the function of the mental and social sciences, including vocational guidance, must in the nature of things be different. It can not be centralized control, but rather the dissemination of knowledge and illuminating ideas by which all persons will be enabled to guide their *own* lives more intelligently. We cannot choose a vocation for any individual, but we can place before him such information that many mistakes commonly made would be practically impossible.

This educational function of vocational guidance naturally consists of two parts. The one, which has been well discussed in the literature, is the field of information about occupations, their requirements, opportunities, distribution, rewards, etc. This, which is certainly the most essential field, might be called occupational sociology. The other field, to which slight attention has been given so far, is knowledge of *human nature*. It is to this that I would call attention, as my final suggestion. I believe that a complete program of vocational guidance in a school system, especially in the colleges and high schools, should include some kind of a course of study of the science of human nature; the purpose being to teach the youth a more intelligent understanding of himself and of other persons. In other words, I would advocate the study of elementary psychology and social psychology at least as far down as the high schools, and reading courses in the

same for employed, continuation school students, etc. Not that the name psychology is essential, nor that the subject would be taught in anything like the traditional text-book way.

Such a course should include the following topics: The nature of stimuli and reactions, the formation of habits, the principle of the conditioned reflex (call it what you will), the most effective modes of learning, the nature of sentiments and interests, the nature and conditions of ability, the concepts of continuous variation and individual differences; and above all, the psychology of custom, convention, tradition, and fashion. The last I would interpret in the light of Trotter's "herd-instinct"—the concept of man as a gregarious animal and hence fundamentally irrational in his beliefs and activities, including his vocational sentiments and adaptation to vocational life, which unreason can be corrected only by patient study and open-mindedness. These concepts properly interpreted and adapted to age and past education would, I believe, be no more difficult, and far more interesting, than much of the traditional subject-matter students are now compelled to absorb. A good deal of material of this kind is presented now in the English course, including composition, public speaking, literature, courses in business forms, courtesy, etc. This is valuable: the possibilities of its development are illustrated by Davis' book on "Vocational and Moral Guidance." In general, however, I do not think the English course is adequate for what I suggest. For one thing, the English teacher teaches a subjective psychology, whereas I believe the objective psychology of stimuli and behavior is the thing needed. Secondly, the English course makes *language* too much of an *end* in itself—places the established forms on a sacred pedestal—instead of viewing them as mere tools for efficient communication and thinking. Third, the English course as usually taught is colored by too great a reverence for the past and not enough for progress and efficiency.

Such a course of study would, I believe, materially aid the youth to understand his own attitudes and sentiments toward vocations, the mass of traditions and conventions to which he must adapt, and the peculiarities of his fellow men whom he must obey, command, or co-operate with, in vocational life. The aim would be not a morbid introspection of self and motives, but an intelligent, objective understanding of self that would do away with this very morbidness of which introspection is accused.

THE CURVE OF WORK AND THE CURVE OF SATISFYINGNESS

By Edward L. Thorndike, Teachers College, Columbia University

Twenty-nine adults worked at grading printed compositions for approximately two hours on each of two days as continuously as they could. The speed of the work was scored by the time required for each ten compositions; the quality of the work was scored by the average deviation (regardless of signs) of their grades from the average judgment of twenty or more competent graders; the satisfyingness or tolerability or zest or interest of the work was scored from 0 to 10 at the end of each approximate twenty minutes, 0 meaning the greatest discomfort or distaste or aversion the subject had ever experienced for mental work in his life; 5, his average enjoyment of mental work during the year or so past; and 10, the greatest interest, zeal or satisfaction he had ever experienced in mental work or play. 1, 2, 3, 4, 5, 6, 7, 8 and 9 were to mean equal intervals from the 0 to 5 and from the 5 to 10. A half-hour of fore-exercise was taken to familiarize the subject with the method of grading.

The general result is that the quantity and quality of the product produced per unit of time both remain substantially the same during the two-hour period, but that the satisfyingness as reported decreases greatly. It decreases rather steadily from beginning to end. The facts are as follows:

Dividing each individual's work during the two-hour period into three approximately equal successive parts, the average errors per composition in successive sixths stand in the proportions:

$$100 \quad 103.8 \pm 1.7 \quad 101.6 \pm 1.7$$

The average times required to read and grade the compositions in successive thirds stand in the proportions:

$$100 \quad 97.3 \pm 1.0 \quad 100.6 \pm 1.0$$

The average degrees of satisfyingness in successive sixths were:

$$4.4 \quad 4.0 \quad 3.6 \quad 3.4 \quad 2.8 \quad 2.6$$

These facts concerning satisfyingness are repeated in Fig. 1.

The curve of work done (in the sense of the quantity and quality of product produced per unit of time) is thus approximately a line of zero slope, but the curve of satisfyingness of

the process of producing it shows a sharp descent. I present (in Fig. 2) curves separately for those whose satisfyingness in the first twenty minutes was from 3 to 4, those beginning at from 4 to 5, and those beginning at 5 to 6.0. Two individuals who began with a satisfyingness of 1 and 2 respectively found the work equally intolerable throughout.

These facts support the general doctrine that the effect of lack of rests is far greater upon whatever is the physiological basis of interest, willingness, or tolerability, than upon the physiological basis of quantity and quality of product produced. Or, in other words, the mechanisms determining the mind's achievement are left able to do their customary work, but in such a condition that their customary action is less satisfying, so that (except for extrinsic motives) the individual would relax, intermit or abandon the action in question.

Five individuals performed an experiment the same as that described above, save that they worked for four hours continuously, instead of for two two-hour periods. The results from their records confirm the results already given. The average errors in successive sixths of the five hours were in the proportions:

100 99 98½ 98 92 92

The average time required to read and grade the compositions were in successive sixths in the proportions:

100 95 93 95 94 97

The average scores for satisfyingness were for successive twelfths of the four hours:

6.0, 5.7, 5.2, 5.0, 4.6, 4.3, 3.6, 3.3, 2.8, 2.4, 2.5, 2.2

The curve for satisfyingness is thus as shown in Fig. 3.

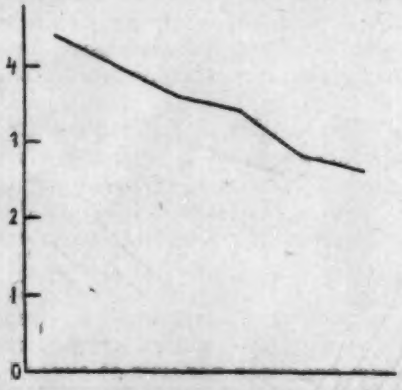

Fig. 1. General Average Curve of Satisfyingness During Two Hours.

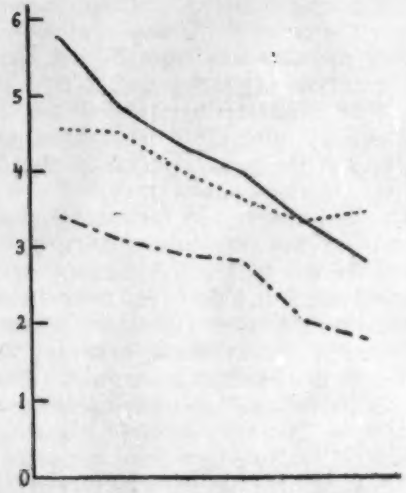

Fig. 2. Average Curves of Satisfyingness of Three Groups Differing in Initial Satisfyingness.

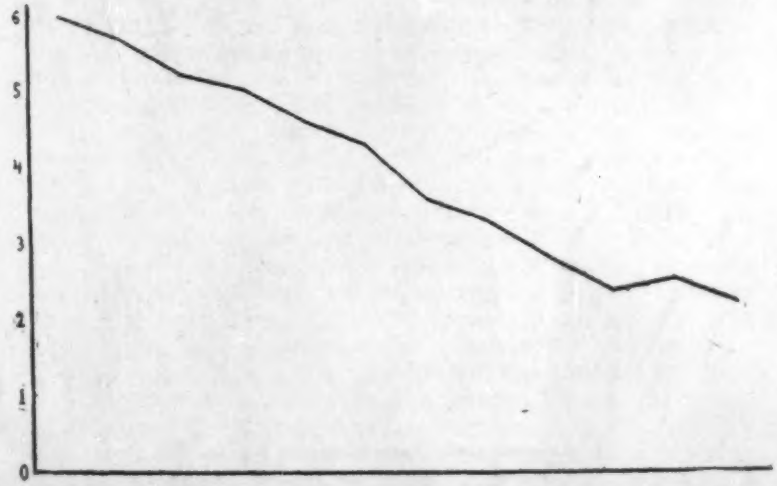

Fig. 3. Average Curve of Satisfyingness During Four Hours.

PSYCHOLOGICAL TESTS FOR STENOGRAPHERS AND TYPEWRITERS

By HERBERT W. ROGERS, Columbia University.

1. Statement of the problem.

The present study represents an attempt to actually test out in practice the method of "empirical vocational tests" and to discover, if possible, tests for specific commercial functions which may have practical significance. To quote Hollingworth's account of this method: "If the test records and ability of any particular type of work show a high positive correlation so that an individual who is good, medium, or poor in the one is, as a mere matter of fact, also found to be good, medium, or poor in the other, then, without further analysis, the one may be used as the sign of the other."

The type of work selected for correlation with the tests in this experiment was the work included under the term "stenographic ability." The three external factors in stenographic ability seem to be a knowledge of (a) stenography, (b) typewriting, (c) grammar, spelling, punctuation, etc.

2. Material employed.

Ten tests which measure the speed of mental functions or processes were used in the experiment. Nine of these tests were taken from the group of tests standardized for the American Psychological Association by Woodworth and Wells. The tenth test was one of the Trabue language tests. Five of these tests were those commonly called the logical relations tests, opposites, verb-object, agent-action, action-agent and mixed relations. Under the head of "the understanding of directions" the hard directions test was used. From the cancellation tests the number checking test was selected, a group being checked whenever it contained the two numbers 8 and 9 in any combination. Under the formation of new associations the form substitution test was used. The color naming test was also used.

3. Conduct of the experiment.

(a) Individuals serving as subjects.

Eighty-seven young men and women who were students of either or both typewriting and stenography in the Extension Department of Columbia University served as subjects. These

people were divided among five different sections—four evening classes and one day class. In all of the evening classes it was impossible to obtain any adequate knowledge of the subjects' abilities, for they either dropped out in a short time or failed to take the prescribed tests and examinations.

The results worked up in this experiment are based upon the day group of forty-five subjects—forty-three women and two men. These people made a rather intensive study of both typewriting and stenography devoting two hours, in class, to each subject for five days a week. Some outside study was also done.

In the group there was represented a very high type of native ability for the stenographic profession as will be seen by the following table:

EDUCATION

.02 had a common grammar school education.
.02 attended high school for one year.
.51 had a full high school education.
.11 attended college for one year.
.09 attended college for two years.
.22 were college graduates.

AGE

.46 were from 16 to 19 years old, inclusive.
.29 were from 20 to 24 years old, inclusive.
.06 were from 25 to 29 years old, inclusive.
.11 were from 30 to 34 years old, inclusive.
.04 were from 35 to 38 years old inclusive.

(b) General procedure.

The Trabue, number checking and form substitution tests were given by the group method. The remainder of the tests were given individually. The method of conducting the experiment was very simple. The subject was seated comfortably at a table, on which the test blanks were shown, one at a time, after it had been ascertained that the subjects understood the instructions. In the Trabue, number checking, form substitution, and hard directions tests the replies were filled in with pencil. In the remainder of the tests the replies were spoken. In the tests where the replies were read aloud the experimenter, who sat next to the subject, had a sample of each test and if an inaccurate reply was made the subject was required to correct it before proceeding to the next word. All the tests were made between the hours of 12:30 and 3 p. m., in the month of November, 1915.

(c) Instructions to the subject.

In the instructions to the subject an attempt was made to combine the proper comprehension of the experiment by the subject with an ideal uniformity of instruction. In the individual tests instruction was given by description, illustration and execution. The subject was first clearly told the meaning of the test; then the operator performed a small sample of it, and finally the subject himself performed a small sample of the work. These samples were typewritten and the same trial sheet was used with all the subjects. From four to six illustrations of each test were used. In the class tests the subjects were simply told what they were to do and the operator performed a sample of the work on the blackboard.

An attempt was made to impress upon the subjects the fact that speed was the main object of the tests. They were told that their mental reactions were being timed and that their individual results were going to be compared with the rest of the class. They were requested to go as fast as possible but were warned that they would have to correct their mistakes. It seemed that the great majority of the subjects tried to make all the speed possible.

(d) Records.

In the individual tests the time was taken by a split second watch reading to fifths of a second, the watch being started when the subject's eyes met the first work on the paper, which was uncovered by the experimenter.

Class tests. In the number checking and form substitution tests instructions were given out, before the test was begun, that as soon as anyone finished she was to raise her hand. When the first hand was raised the experimenter called upon the class to stop (having instructed them before that he would do this). Thus the time for all was the same and the experiments were worked up for the amount done. In the Trabue test the subjects were given ten minutes to finish and those who finished before this time had a note made on their paper of the time.

4. Method of working up the results.

(a) Treatment of errors.

Errors in the hard directions, form substitution, and number checking tests have been disregarded. The basis of getting measures was simply the time in the hard directions test and the amount done in the form substitution and number checking tests. In the Trabue test, as given, there are three inconstant factors, namely, the amount done, time, and errors. No attempt has yet been made to score and correlate this test.

(b) Methods of combining the individual measures.

When several tests have been made of an individual's abilities it is often desirable to show the success of each individual in the series of tests taken as a whole. A good way of doing this is the order of merit method. The measures of an individual are arranged so that we can state that an individual stood 13th in one test, 23rd in another test, 18th in still another test and that his average rank was 18th.

Although this is a rather rough method, it has worked out well with some sorts of material. But to transmute absolute quantitative measures into an order of merit is to throw away a great deal of information contained in the measures. There is another method which preserves all the refinement of the original measures which has been proposed by Woodworth. The average of the group in each test was counted as zero, and the individual's standing was expressed by a deviation above or below this average; the measure of variability (mean square deviation) was taken as the unit deviation, all deviations being expressed in multiples of this unit. What this method does is to assign each individual's position in the distribution of the group. This method was used in getting reduced measures in the tests which were to be correlated with ability in typewriting.

(c) Methods of correlation.

The order of merit method was used in correlating the tests with ability in stenography and grammar. The rank differences formula was used, $r=1-\frac{6\Sigma d^2}{n(n^2-1)}$

The formula used for correlating the tests with ability in typewriting was a derivation of the Pearson formula, $r=2Av.\left(\frac{a+b}{2}\right)^2-1$, a and b being the reduced measures in the test and typewriting.

In getting the team correlations in typewriting the combined reduced measures were corrected by dividing through by the square root of the average of the squares of the reduced measures.

(d) Methods of obtaining measures of stenographic ability.

In stenography the instructor's mid-year grades were transformed by him from the vague statements of A. B. C. D. F. into a strict order of merit series from one to forty-five.

In grammar the subjects were examined in spelling, grammar, punctuation, letter writing, paragraphing, etc. Their grades, which were returned in per cents, were readily transformed into an order of merit series.

In typewriting more objective and reliable grades were obtainable since the young women were given a typewriting exercise each month. The subjects wrote on the typewriter for ten minutes from dictation. The total number of words written was added up, five words were deducted for each error; this sum was then divided by ten and the result expressed the net number of words written per minute. These objective grades are free from the error of an instructor's judgment. Correlations were made every month between the mental test given in November and the monthly grade in typewriting.

5. Results.

A. Correlations.

	Opposites	Verb-object	Agent-action	Action-agent	Color naming	Mixed relations	Directions	Number checking	Form subs.	Subjects
Stenography	.45	.36	.19	.23	.34	.31	.46	.07	.40	45
Grammar	.40	.37	.37	.35	.38	.43	.54	.22	.16	45
Typewriting:										
October	.17	.41	.29	.42	.30	−.09	.11	.45	.21	42
November	.11	.43	.19	.43	.43	.21	.14	.47	.27	40
December	.07	.46	.40	.29	.45	.17	.19	.37	.11	40
February	.15	.55	.31	.41	.41	.25	.13	.53	.37	40
March	.19	.21	−.02	.00	.29	.04	.34	−.01	.30	29
April	.54	.57	.28	.40	.61	.00	.32	.30	.42	27
Average	20.5	43.8	24.8	32.0	41.0	13.0	21.0	35.0	28.0	36.0

B. Team correlations.

Stenography

1. Opposites, verb-object, color, mixed relations, directions, form ..... .40
2. Opposites, verb-object, agent-action, action-agent, color, mixed relations, directions, number, form ..... .48
3. Opposites, directions ..... .51
4. Opposites, verb-object, color, mixed relations, directions .53
5. Opposites, verb-object, directions, form ..... .61
6. Opposites, directions, form ..... .63

Grammar

1. All tests ..... .53
2. Opposites, verb-object, agent-action, action-agent, color, mixed relations, directions ..... .57
3. Opposites, mixed relations, directions ..... .56

Typewriting

1.	Verb-object, action-agent, number	.56
2.	Verb-object, agent-action, action-agent, color, number	.56
3.	Verb-object, action-agent, color, number	.58
4.	Verb-object, agent-action, action-agent, color, number, form	.62
5.	Verb-object, color, number	.63

(c) Discussion of correlations.

In considering the first four months' correlations in typewriting one is met by the very striking fact of the uniformity of the results for all the months in any one test. If a test is high one month it can be predicted that it will be high another month; if the test is low one month it can be predicted that it will be low another month. In other words we can give the subject a typewriting test at any time and the correlation will always be practically uniform.

The March correlations show no corespondence with the correlations of the other months. The March typewriting test was an especially difficult one. This means that it called for reactions which the subjects had not been in the habit of making—it called for the functioning of processes which did not exist or which were not well developed. Thus, since the exercise was exceptional, it might be expected that the results and therefore the correlations would be exceptional and the uniformity of correlation would be absent. It must also be taken into consideration that there were only twenty-nine subjects instead of forty as usual.

The April correlations show a good degree of correspondence with the first four months, except for the opposites and number checking tests. But here again it will be noted that only twenty-seven subjects took the exercise. The reduction in the number of people taking the tests does not show a process of an elimination of the unfit, for some of the best pupils were in some of the university offices doing work in typewriting.

It is interesting to note that none of the tests, which when combined into teams give the best correlations with stenography and grammar are used for giving the best team correlation with typewriting.

It is also an interesting fact that the two tests which are distinctly not language tests—number checking and form substitution—do not correlate well (except in one instance) with stenography and grammar, but that one correlates very well and the other fairly well with typewriting.

(d) Correlation and practice.

The following table will show that practice tends to increase the correlations, as has been pointed out by Hollingworth. Only the first four months' correlations are used on account of the distracting factors operating in the fifth and sixth months. Table 1 gives the average correlations of the tests which have a high positive correlation with typewriting. Table 2 gives the correlations of all the tests:

	1 Tests Verb-object Color Form Average	2 Tests All Average
October	.387	.253
November	.443	.293
December	.427	.266
February	.493	.345

6. General Summary.

It is evident from the foregoing data that this method of "empirical vocational tests" gives a far more reliable criterion for vocational guidance in the field of stenography than has ever been attained by any other method.

From the results obtained in this experiment on forty-five subjects it does not appear to be too optimistic to the writer to say that under more favorable conditions a series of tests could be found which would give a much higher correlation than we have found here and which would yield a better criterion for a system of vocational guidance and selection in the stenographic profession. If a much larger group of subjects were worked with the correlations would probably be raised and would then be more reliable. If more tests were given there would undoubtedly be more tests found to have a high positive correlation with the work, and the correlations would be raised when they were teamed. Furthermore, the conditions of conducting the experiment could be improved. In short there were many factors which tended to lower the correlations which could be, in part, eliminated.

From the foregoing facts it is evident that these miscellaneous tests are of practical significance. It is also evident that the method of "empirical vocational tests" does actually work out in practice.

ASSOCIATION-REACTIONS APPLIED TO IDEAS OF COMMERCIAL BRANDS OF FAMILIAR ARTICLES[1]

By L. R. Geissler

I. *Introduction*

The scientific study of the psychological aspects of marketing began with the investigation of the mental factors involved in the commercial efforts of appeal through advertising. The center of the problem was the mind of the prospective customer, and the question to which psychology first applied itself was: how may a person be persuaded most effectively through advertising to purchase a certain commercial brand of article? The immediate success of the early work was the more striking because it introduced scientific principles where before only haphazard and unsystematic efforts based on costly experiences had prevailed. It was not difficult to point out the various psychological principles that were violated even by the best advertisements of that time and to convince the most progressive business-men that adherence to these principles would result in financial gains.

Nevertheless the deeper problems which require a closer scrutiny and finer analysis of the mind of prospective customers have hardly been touched, and yet the interest in this phase of applied psychology seems to have very much subsided and given way to the problems of salesmanship. The main question now under investigation is: How may a person most effectively persuade others to buy a certain brand of article? This shift of emphasis from customer to sales-clerk in the psychology of marketing is significant in several respects. In the first place, it does not promise such spectacular results by simple methods as the early work did, but requires instead much patient, persistent and well planned work. In the second place, it will thereby teach a most wholesome and much needed lesson of being contented with slow and small progress instead of looking for immediate and large returns. And finally, it will lead to the establishment of much more refined and subtle methods of research in the various fields of business psychology. Thus it may ultimately lead to a revision of the early pioneer work in the psychology of advertising, especially if the latter has not in the meantime regained some of its original interest and impetus. In particular it will become necessary to realize that a study of the mind of prospective customers must be approached from a broader standpoint than that of the advertisement only. The advertisement is only one, and perhaps a comparatively insignificant item in the mental life of the layman whose needs and desires are determined by complex situations to which he has to adjust himself, and not simply by a series of advertisements to which some business concern

[1] The writer is indebted for co-operation in gathering data to Professors R. S. Woodworth of Columbia University, Max Meyer of the University of Missouri, Herbert Woodrow of the University of Minnesota, C. S. Yoakum of the University of Texas, and L. L. Thurston of Carnegie Institute of Technology, Pittsburgh; and to his wife for much patient and conscientious aid in classifying and computing the statistical material.

wants him to react favorably. There seems to be a tendency to overlook the other factors which influence a person to purchase articles of certain brands; and therefore it seems appropriate to determine how strong an influence the advertisements exert in a person's daily life, as compared with other factors, and to attempt to list some of the more important of these influences.

The present study was thus undertaken to gain, at least in a preliminary way, such a more general insight into the mind of a person who may be contemplating the purchase of a given article. In particular, we attempted to determine which brands of certain articles are thought of first, most frequently, and why? For this purpose the following experiment was devised. We prepared a list of the names of twenty articles which men are apt to buy for themselves in the retail trade, as follows: baseball, camera, candy, clothes, collar, soft drinks fountain-pen, garter, hat, popular magazine, notepaper, penknife, shaving tool, shirt, shoes, soap, summer-underwear, tobacco, tooth-paste, and watch. This list was submitted to groups of men who had been provided with prepared blanks of paper on which appeared a narrow vertical column, headed "Brand" and a wide one, headed "Reason." The experimenter read to each group the following set of instructions:

"After a warning signal I shall pronounce the name of an article which men are apt to buy for themselves in the retail trade, such as: handkerchief, ink, scarf-pin, etc. Let the word call up in your mind a particular commercial brand or trade-name of the object; for example: "ink" may call up "Carter's," or the like. Write immediately the first name which thus occurs to you in the column headed "Brand." In the remaining space of that same line (headed "Reason") indicate as far as you can and in as few words as possible what you believe to be the main reason why the particular brand occurred or came first to your mind. If there are several such reasons, write them in the order in which you think of them, but do not use more than one line for each article and its reason. If, however, no brand occurs to you within the time allowed, or if no good reason can be found for a certain brand, make a dash in the proper place and wait for the next word. There will be twenty articles; one minute is allowed for each.

Let me now give a concrete illustration of the whole procedure: I may say, for example, "Number seven — ready — rain-coat," and some one may write, for example, "Goodyear — I possess one," or another reason "saw a street-car poster of it," or the like. Keep in mind that "brands" or "trade-names" are not the same thing as names of local stores or of retail dealers."

After assuring himself that all subjects had correctly understood these instructions, the experimenter proceeded with the words of the list. This experiment was carried on in the following states: Georgia, Illinois, Massachusetts, Minnesota, Missouri, New York, Pennsylvania, and Texas. While the number of young college men tested in each state varied greatly, we obtained results from 300 subjects giving a total of 6,000 data, and on the whole these data are very uniform. The slight differences due to peculiarities of localities will be pointed out later, after we have discussed our results from the points of view of the brands, of the reasons for their occurrence, and of the classes of articles.

II. *General Psychological Factors*

In considering our data with reference to the commercial brands mentioned, we must remember that our subjects were instructed to

write down the *first* brand which occurred to them after hearing the name of a given article. If there are no special factors entering into the situation which favor for the time being the recall of one particular brand, we are justified in assuming that those brands will first occur to mind which in the past experiences of the individual have formed the strongest associations with the respective articles. This assumption is borne out by a repetition of the experiment after several months' interval with four of our subjects. They thought of the same brands which they had previously mentioned with the following six articles: baseball, camera, collar, drink, garter, and hat. The brands of magazine, notepaper, shoes, and soap had been changed by two subjects each, while the brands of the remaining ten objects had been changed by only one subject each. In other words, of the eighty possible changes in brand only eighteen had occurred, while in the other sixty-two cases (77.5 per cent.) the same brands were mentioned in both tests. This number therefore indicates the strength and permanence of the associative bonds between certain articles and their respective commercial brands.

The question why in any given individual the idea of a certain article has formed a stronger bond with the idea of one commercial brand rather than with that of another, is entirely a matter of a person's past experiences. The factors which determine the formation of such bonds are included in the psychological laws of the association of ideas,—similarity, contrast, contiguity in space, temporal simultaneity and succession, frequency, recency, primacy and vividness of experience, and emotional congruity. For the sake of clearness of exposition we may call the strongest association between the idea of a given article and that of a certain brand the bond of greatest familiarity. Perhaps the highest degree of familiarity is represented by such associations as: Romeo and Juliet, or 1492 and Columbus' discovery of Ameica, or *pro and con*, or Royal Baking Powder, and the like.

In many cases an individual may be able to tell from his past experiences that a certain commercial product has become the most familiar brand to him; and he may also be able to assign a reason. If, then, under the condition of our experiment, the most familiar brand actually occurs first in his mind, he may give as the reason for its occurrence that particular fact of his past experiences which helped to make this brand his most familiar one. On the other hand, the associative bond may be of such an age and degree of automatization that the person is absolutely unable to give any reason whatsoever for thinking first of the familiar brand, beyond the mere statement that it came to his mind first of all or that it was the most natural idea for him to think of. We have found a few such cases reported by our subjects.

It may sometimes happen that the idea of the most familiar brand is not the first one to occur, because there may be certain factors in the general situation which temporarily strengthen a weaker bond formed between a certain article and one of its less familiar brands. Here again a person is in most cases able to tell which particular factor induced the recall of the less familiar brand and mention this factor as the reason why he thought of the brand first. Actual examples of such cases are indicated by reasons like the following: "I saw this brand last evening, but never used it," or "Heard a joke about it (brand A), use (brand B)." In the first example the factor of recency, in the second, the factor of vividness was responsible for the first occurrence of the idea of a seemingly less familiar brand.

There are, of course, cases where the recall of the most familiar

brand is further strengthened by some favorable factor in the general situation, so that this factor may be mentioned as the main reason for the occurrence of the brand, while as a matter of fact it may be only a secondary or contributary reason. It is therefore impossible to discover how many of the reasons given indicate greatest familiarity and which or how many imply that a less familiar brand has been temporarily so strengthened as to occur first in the mind of the subject. However, it was not our purpose to study the familiarity of different brands; such a problem could have been investigated much more directly by asking the subjects to state the brands with which they are most familiar.

III. *Commercial Brands*

The results of our investigation with regard to the first occurrence of commercial brands according to our instructions are summarized in Table I.

TABLE I

ABSOLUTE FREQUENCIES OF VARIOUS KINDS OF BRANDS OF ARTICLES

1	2 Article	3 No. of brands named	4 Most freq. brands	5 2nd freq. brands	6 Most and 2nd freq. brands	7 Miscel. brands named	8 No. brands named
2	Garter.....	12	192	85	277	12	11
3	Underwear....	17	248	18	266	30	4
4	Camera.....	18	157	52	209	82	9
5	Fountain-pen .	19	146	72	218	82	..
6	Watch.....	20	97	60	157	143	..
7	Baseball.....	23	179	53	232	42	26
8	Toothpaste...	25	155	78	233	61	6
9	Averages.....	19	170	60	227	65	8
10	Collar.....	35	224	19	243	51	6
11	Shaving tool..	35	162	17	179	101	20
12	Soft drink....	36	194	11	205	90	5
13	Tobacco.....	37	100	57	157	139	4
14	Soap.....	42	121	39	160	140	..
15	Penknife.....	45	168	14	182	79	39
16	Hat.....	47	149	35	184	94	22
17	Averages.....	40	160	27	187	99	14
18	Magazine.....	54	72	39	111	178	11
19	Shirt.....	56	73	44	117	143	50
20	Candy.....	59	38	31	69	196	35
21	Clothes.....	61	86	45	131	144	25
22	Shoes.....	78	58	21	79	210	11
23	Notepaper....	93	21	13	34	178	88
24	Averages.....	67	58	32	90	175	47
25	Grand total...	812	2640	793	3433	2195	372
26	Grand average	40.6	132	39.6	171.4	110	18.6
27	Ratios.....		7 :	2 :	9 :	6 :	1

A glance at column 3 of this Table will show that our 300 subjects were familiar with 812 different brands of 20 articles or about 40.5 brands per article. Furthermore, column 8 shows that there was not a single person among these 300 men who could not mention immediately some commercial brand of fountain-pen, soap, and watch. Only in 372 of the 6,000 possible cases, or in 6.2 per cent., did any brand fail to occur within the time allowed. This number ought to be slightly increased, perhaps to 7 per cent., because there were a few times when it was impossible to tell whether the names mentioned as brands were or were not names of local dealers. All other cases in which the name of a local dealer or a special variety of an article (for example, straw-hat) was wrongly mentioned are included in the last column, headed "no brands named."

According to the frequencies of various brands our twenty articles fall into three groups, as is indicated in Table I. Beginning with the article of which the fewest number of different brands were mentioned, namely garter, of which 12 brands or trade-names were quoted by our subjects, and proceeding to the article with the largest number of different brands, we find in the first group the following articles: garter, summer-underwear, camera, fountain-pen, watch, baseball, and toothpaste. This group results in an average of 19 brands per article. To the second group belong: collar, shaving tool, drink, tobacco, soap, penknife, and hat, with an average of 40 brands per article. The last group includes: magazine, shirt, candy, clothes, shoes, and note-paper — an average of 67 brands per article.

These three groups show great similarity in other respects. For example, with regard to the inability of naming any brands, the first group has also the lowest average of such cases, namely 8 per article; the next group has an intermediate number of 14; and the last group has the highest average, namely 47 per article. In other words, the fewer the number of brands mentioned, the smaller is the likelihood of the inabliity to mention any, and conversely. Logically one might have expected the opposite result, namely, the more brands of an article are known to exist the less likely would be the inability to mention any one brand. The actual fact as revealed by our Table may probably be explained from the principle that the fewer brands of an article are known the more is everybody apt to be familiar with some one of the few, and conversely.

This explanation is strongly favored by the results of columns 4 to 7. From column 7 we find that the fewer brands of a given article are known the smaller is the number of people who mention the less widely known brands, and conversely. In the case of the articles of the first group, there were on an average only 65 of our 300 subjects, that is 22 per cent., who mentioned what we have called miscellaneous brands, that is, brands which in frequency rank from third to last place. Similarly for the second group; here we have 99 subjects or 33 per cent. who mention miscellaneous brands; while for the third group there were 175 subjects or 58 per cent. who think of some miscellaneous brand first.

Another confirmation of our principle of explanation is found in column 4. According to it, the fewer brands of an article are known the greater is the frequency of the most widely known single brand. Thus the average number of subjects who mention the most widely known single brands in group 1 is 170 or 57 per cent.; the corresponding average for the second group is 160 subjects or 53 per cent., and the average of the third group is 58 subjects or 19 per cent. Here the difference between the first and second group is very small, but that

between the second and third group is very large. Consequently the opposite relation must be expected to hold with the second most widely known or second most frequently mentioned brand, as is shown in column 5. Combining now the results with the most frequent and the second most frequent brands, as is done in column 6, and comparing these two most frequent or most widely known brands with all the other miscellaneous brands, we have a further verification of the explanatory principle stated before, namely, the fewer brands of a given article are known, the more widely will one or two brands of that article be known. This fact is probably the psychological reflection of the economic effects of monopoly; however, we are not concerned in this place with economic explanations.

Before advancing to the next general phase of our results, it is interesting to note briefly the grand totals of Table I. As has been pointed out already, our 300 subjects could name 812 different brands of 20 articles, or on an average about 41 brands per article. Furthermore, for every person who could not mention any brand of a particular article there were six persons who knew a variety of miscellaneous brands and seven persons who mentioned the same brand as the most frequent. In other words, our 300 subjects whose homes were located in eight widely separated geographical regions of the country show a "community of ideas" with regard to commercial brands of articles in everyday use which amounts to 43 per cent. for the most widely known varieties, and to 13 per cent. for the second most widely known varieties of brands. Such a result is probably due solely to the nation-wide advertising campaigns conducted by many of our large manufacturing and business concerns. We have in our results therefore a very tangible measure of such intangible influences as are represented by the various kinds of advertising methods.

IV. *Reasons*

We may now examine our results from the standpoint of the reasons stated by our subjects for the first occurrence of a particular brand. Again using frequency as the basis for a classification of these reasons, we find a most frequent reason, a second most frequent reason, 38 miscellaneous reasons of varying frequency, and a small number of cases in which no reasons could be given.

A list of the 38 miscellaneous reasons together with their respective frequencies and also the number of articles with which these reasons recur is appended. The phrasing of the reasons is in most cases somewhat condensed from their original form, and reasons of very great similarity are combined. For example, the first reason listed contains such varieties as: "I like it because it wears well," or "Like its taste," or "I admire their style," and the like. The second reason listed includes such statements as "My father uses it," or "Room-mate has one," or "We have it at home," and the like. In the third reason we have combined such statements as "I sold it last summer" with such reasons as "I worked for a firm which handled that product." There is of course some element of arbitrariness involved in this method of combining; and a glance over the whole list will reveal several other possibilities of making combinations that have not been used. For example, the ninth reason "Best on the market," the tenth, "Best known," and perhaps the fifteenth, "Great popularity" might have been combined under the general heading "Reputation." There is, however, little advantage to be gained from these combinations. Their great disadvantage lies in the fact that the list would become too abstract because the phrasing of the reasons would be too different

LIST OF 38 MISCELLANEOUS REASONS

	Frequency of reason	No. of article	Class
1. A brand is liked because of its special characteristics	163	18	A
2. Friend uses brand, used at home, etc.	95	13	B
3. I sold this brand (worked for firm)	84	18	C
4. Saw it displayed in store or window	69	11	E
5. This brand has widest use	67	12	A
6. I prefer this brand (it is my favorite)	60	9	A
7. Am acquainted with person selling this brand	56	14	B
8. Heard of it (saw it, etc.) recently	52	14	C
9. " Best on the market "	50	10	D
10. " Best known " (has best reputation)	43	9	D
11. Factory near my home town (made near home)	41	11	E
12. This brand is frequently seen	37	8	C
13. Used by railroads, leagues, schools	35	2	D
14. First brand I knew or learned about	34	11	C
15. Great popularity, everybody likes it	26	8	D
16. I hear most about this brand	26	8	C
17. " Standard " (considered the standard brand)	24	9	D
18. I dislike the brand, hate it, " never again "	21	6	A
19. I had some accident with this brand	20	10	B
20. " Only brand known to me "	18	8	B
21. Peculiar name, odd, euphonious name	16	10	C
22. I made some special use of brand	16	11	B
23. I pass place where it is made or sold	16	8	E
24. Recommendation	15	6	D
25. Special memories and associations (boyhood)	14	10	B
26. Jokes and puns about the brand	13	6	B
27. Firm has big reputation	12	6	D
28. Price, its cheapness, most expensive	11	8	A
29. Its name same as that of subject	8	6	B
30. Historical associations with brand	8	5	B
31. Criticisms made or heard of brand	6	2	B
32. I received one of this brand as present	5	4	B
33. Associated with familiar personage	5	4	B
34. " Good tradesmark "	5	2	D
35. I see one of this brand before me now	5	2	B
36. I have always desired one of this brand	4	2	B
37. It is made by the largest manufacturer	3	2	D
38. Novel brand, latest out, etc	3	2	C
Total	1186		

from those actually stated by our subjects. Furthermore, several significant, though perhaps small, shades in meaning would be eliminated by a further condensation of individual items.

We may, however, classify the 38 miscellaneous reasons into the following groups:

A. Reasons involving personal estimates of brands,
Nos. 1, 5, 6, 18 and 28 ..... Total, 322 cases

B. Reasons revealing some personal emotional touch,
Nos. 2, 7, 19, 20, 22, 25, 26, 29, 30, 31, 32, 33, 35 and 36.....Total, 273 cases

C. Reasons referring to miscellaneous personal experiences,
Nos. 3, 8, 12, 14, 16, 21 and 38.....Total, 252 cases

D. Reasons containing impersonal estimates of brands,
Nos. 9, 10, 13, 15, 17, 24, 27, 34 and 37.....Total, 213 cases

E. Reasons referring to special localities,
Nos. 4, 11 and 23.....Total, 126 cases

The titles of these groups indicate the underlying criteria for classification which are based on a detailed examination and psychological interpretation of the phrases actually employed by our subjects. The list of the reasons given on another page makes reference to this classification in the last column by the letters A, B, C, D, and E. The first three groups refer to our subjects' personal experiences with the commercial brands and total 847 cases or two and one-half times as many as groups D and E, which total only 339 cases and contain reasons of an impersonal nature. These proportions between personal and impersonal references to the brands are somewhat changed if we add to the first three groups the most frequent reason of all, namely that of personal use or ownership, and to the last two groups the second most frequent reason, that of advertising. Under these conditions the reasons of a personal nature occur only twice as often — namely in 3,683 cases — as the impersonal reasons, which occur in 1,853 cases.

The relation of the frequency of miscellaneous reasons to the different articles is indicated in Table II, column 7. The greatest number of miscellaneous reasons occur with magazine and baseball, namely 121 and 120 respectively, thus giving these two articles first and second rank respectively, as is shown in column 8. The decrease in number of miscellaneous reasons for the various articles is very gradual; the smallest number and therefore the lowest rank is reached by garter with a frequency of 22. The average number of miscellaneous reasons for all articles is about 59. Miscellaneous reasons are given in a total of 1,186 cases which constitute 19.77 per cent. of all 6,000 cases or 21.42 per cent. of all the reasons mentioned in this study.

The inability to assign any reasons for the first occurrence of ideas of commercial brands is indicated in columns 9, 10, and 11. To the mere inability, as shown in column 10, there must be added the cases where no brands could be mentioned, as is shown in column 9; column 11 gives the rank as based on column 10. With two articles, namely watch and soap, we find no inability to state reasons, while with baseball this inability is greatest, occurring 14 times.[2] On an average we find 4¾ cases per article in which no reasons can be assigned, or a total of 95 cases out of 5,628 possible cases, that is less than 2 per cent. This low number shows that the task of telling why the idea of one kind of brand occurs in mind before the idea of some other brand is easily performed even by subjects untrained in psychological introspection.

In column 12 are shown the total number of different reasons men-

[2] In the case of clothes there are more reasons than brands mentioned, which is due to the fact that here more than with any other article names of local dealers were mentioned as brands and had to be classified under "no brands."

TABLE II

ABSOLUTE FREQUENCIES AND RANKS OF REASONS FOR RECALL OF BRANDS

1	2	3	4	5	6	7	8	9	10	11	12
		Freq. of Use		Freq. of Adv.		Misc. Reasons		No Reasons			No. of reasons named
2	Article	No.	Rank	No.	Rank	No.	Rank		No.	Rank	
3	Fountain-pen	207	1	58	15	30	16.5	5	5	12.5	15
4	Collar	197	2.5	69	11	24	19	10	6	10.5	12
5	Watch	197	2.5	43	18	60	10	..	..	2	22
6	Toothpaste	193	4	65	13.5	30	16.5	12	6	14	15
7	Garter	186	5	78	9	22	20	14	3	8	17
8	Shavingtool	183	6	68	12	29	18	21	1	4.5	17
9	Underwear	173	7	76	10	40	13	11	7	15.5	14
10	Shoes	167	8	55	16	67	8	12	1	4.5	14
11	Clothes	163	9	86	7	33	14	18	+7	2	15
12	Soap	147	10	121	3	32	15	..	..	2	13
13	Magazine	141	11	16	20	121	1	22	11	20	18
14	Notepaper	125	12	31	19	53	12	91	3	8	19
15	Shirt	123	13	65	13.5	54	11	58	8	17.5	22
16	Camera	117	14	99	4	65	9	18	9	19	15
17	Hat	104	15	90	6	77	5.5	29	7	15.5	21
18	Baseball	93	16	49	17	120	2	40	14	21	17
19	Soft drink	85	17	134	2	72	7	8	3	8	13
20	Penknife	83	18	92	5	78	4	47	8	17.5	22
21	Tobacco	76	19.5	137	1	77	5.5	9	5	12.5	20
22	Candy	76	19.5	82	8	102	3	39	4	10.5	20
23	Total	2836	..	1514	..	1186	..	464	95	..	341
24	Average	142		76		59		23	4.75		17
25	% 6000	47.26		25.23		19.77		7.73			
26	% 5628	50.40		26.90		21.10					
27	% 5536	51.23		27.35		21.42					

tioned with each article. They vary from 12 to 22 and average about 17 per article.

The most frequent reason, aside from the group of miscellaneous reasons, for thinking of a certain brand of a given article is indicated in Table II, column 3, by the word "Use." This term means in all cases personal use or ownership by the subject, either in the past or in the present, or even intentional future use. Such statements of reasons as the following are typical: "I used to wear this brand," or "I bought one of this kind," or "Am using it everyday," or "I own one," or "Shall buy it this afternoon." This kind of reason is the most frequent one mentioned with 16 articles, but is only the second most frequent reason with candy, drink, penknife, and tobacco. The articles as listed in the Table are given in the order from greatest frequency of the reason "use," namely 207 with fountain-pen, to smallest frequency, namely 76 with tobacco and candy. The average frequency of this reason is about 142 per article, and it occurs in a total number of 2,836 cases. This number constitutes 47.26 per cent. of all 6,000 cases, or 50.4 per cent. of all 5,628 cases in which a brand was mentioned, or finally 51.23 per cent. of all 5,536 cases in which a reason was mentioned.

We must also consider that several of the miscellaneous reasons involve this factor of personal use or ownership. For example, almost the whole group A (with the exception of the fifth reason, "widest use") as well as reasons 19, 22, and 32 of group B imply this factor. This would add a total of 296 cases to the 2,836 original cases. We have in these 296 cases the best illustration of the fact indicated before that personal ownership or use is probably the underlying reason for the maximal familiarity with a certain brand which is either not recognized as such or has become so self-evident or automatized and so much taken for granted that it does not seem to the subjects to suffice as a reason for recalling the brand first. They are therefore led to search their minds for some more particular reason.

But even aside from these additional cases our results of column 3 alone show that *in one case out of two a person will think of a commercial brand of a given article because of his personal ownership or previous use of that same brand.*

The second most frequent reason with sixteen of our articles and at the same time the most frequent reason with the remaining four articles is briefly indicated by the word "advertisement," and its frequency with the different articles is shown in column 5 of Table II. In many cases this reason is given in such specialized forms as: "I saw it advertised in a streetcar," or "I remember the cover of a Saturday Evening Post," or "Large poster in lunch-room;" sometimes it is stated more briefly in such phrases as "Widely advertised" or the like; and finally familiar phrases or slogans from certain advertisements are quoted. This reason is most frequently mentioned with tobacco, 137, and least frequently with magazine, namely by 16 subjects. The total frequency is 1,546 cases, which constitutes 25.23 per cent. of all 6,000 cases, or 26.9 per cent. of all cases in which a brand is mentioned, or 27.35 per cent. of all the reasons stated. The average frequency per article is 76 or slightly more than half the frequency of the first reason (use). In other words, in only one case out of four does a person think of a commercial brand of a given article because he has been impressed by the advertisements of this brand. The ranks which the different articles attain on the basis of this reason are given in column 6. It is to be expected that an article which occupies a high rank on the basis of the most frequent reason will

occupy a considerably lower rank on the basis of the second most frequent reason, and conversely. Exceptions to this relation may be explained by reference to the frequency of miscellaneous and no reasons. Thus with shirt there occur 50 cases of no brands, while with baseball there occur 120 cases of miscellaneous reasons.

The fact that three of the four articles with which advertisement is stated as the most frequent reason and use as the second most frequent reason involve personal consumption (namely soft drink, candy, and tobacco) make it seem plausible to assume either that among our 300 subjects this personal consumption was actually very infrequent (about one person in four), or else that many persons hesitated to admit that such personal use was the main reason for thinking of the brands. The fact that such use is regarded as undesirable by many people is possibly responsible for the infrequency of this reason.

We have thus found that personal use or ownership is by far the strongest reason for thinking of a certain commercial brand first. The obvious question which now arises is: what are the reasons for originating this personal use? Does our investigation throw any light upon this problem? I believe it does, and in a twofold way.

In the first place, the following considerations, which are suggested by our investigation and its results, must be taken into account. There are doubtless many cases in which the original use of a given brand of article is due to the fact that it has been used in the home of the parents of a person for some time before he had any opportunity to buy the article for himself. This is very likely the case with articles like soap and toothpaste. On the other hand, with such articles as collar, garter, shaving tool, underwear, shoes, clothes, shirt, hat, and penknife, our subjects might have acquired the original use from older male members of their families. To be sure, imitation of elders is a very strong factor in adolescent boys, especially before they have found themselves or have been away from home for any length of time. As soon, however, as this moment arrives, they are just as likely to do something entirely different from what was done at home as to continue to imitate, if for no other reason than to assert their own individuality. It is probably at such moments that they are most easily induced by one factor or another to try some new brand of a given article. Among these factors advertising as well as some of the miscellaneous reasons will exert a strong influence. Those miscellaneous reasons would of course be eliminated which involve previous use of a brand, that is, the 296 cases mentioned before, or 5.3 per cent. of all the reasons given.

We may now assume with a high degree of probability that advertising as well as the remaining miscellaneous reasons have been as potent in originating personal use or ownership as they were in suggesting the present brand. If this assumption is correct, then the relative strength of advertising as compared with the remaining miscellaneous reasons is as 27.35 is to 16.12 (i. e., 21.42-5.3), or roughly 5:3. That is to say, in all those cases in which the first cause for using a certain brand of article is not the fact that the same brand is used in the home of the person's parents or relatives, advertising has five chances out of eight for determining which brand a person may begin to use of his own accord. Such factors as working for a firm which carries the brand, store and window display, extensive use of the brand by others, impersonal estimates of the value of the brand, acquaintance with persons selling it, frequent sight of it, its popularity, its peculiar name, recommendation by others, jokes about it, good

tradenames, or the novelty of the brand—all these factors taken together have only three chances out of eight for influencing a person to the extent of inducing him to use a brand for the first time. But this conclusion must remain hypothetical until our theoretical assumption is supported by experimental evidence.

The second way in which our investigation may help to answer the question: what factors induce a person to use a certain commercial brand of article for the first time? is found in another set of data which we obtained from two groups of women subjects. We must however defer their discussion to some future occasion.

V. *Classification of Articles*

We will now continue to study our present data from a third point of view, by classifying our twenty articles into those of necessity or daily use, those of luxury or occasional use, and those of a mixed nature which nevertheless incline strongly toward the first group and may therefore be called quasi-necessities. This classification is carried out in Table III according to the same rubrics as Tables I and II, at least to the extent of showing the most significant similarities and differences between the three groups. We have also included the averages of the combined data of the necessities and the quasi-necessities, in row 19.

An inspection of Table III reveals the fact that on the average the necessities and even more so the quasi-necessities show a much greater absolute frequency of the most frequent brands than the luxuries. The average of the first group is 133, the second 152, (combined 140), and the last 116. A similar difference, although not so marked, occurs with the second most frequent brands, the corresponding averages being 46, 42 (or combined 44), and 34. On the other hand, there is no difference between the three groups with regard to the absolute frequencies of the miscellaneous brands. Again, the necessities and quasi-necessities show only small averages for the cases in which no brands could be named, 16 and 6 respectively (or 13 combined), while in the case of the luxuries the average rises to 27. In other words, there is much greater readiness to recall some commercial brand in the case of articles which are necessary and in daily use than in the case of luxuries, and furthermore, there is much greater "community of ideas" or likelihood for more people to think of the same commercial brands in the case of necessary articles than there is in the case of articles which are used only occasionally and are not necessities. If this relation, which we found to hold among 300 college men, could be shown to have a more general validity, it would indicate that commercial brands in necessities or articles of daily use could gain a control or even obtain a monopoly of the market through advertising more easily than could brands of luxuries or articles used only occasionally.

With regard to the number of reasons named we find only a very slight difference in the case of the second most frequent reason, namely advertisements. Here the necessities have an average frequency of 89, the quasi-necessities 61 (or combined 73), and the luxuries 80. On the other hand, the reason of personal use or ownership has an average frequency of 160 for the necessities, 190 for the quasi-necessities, (or combined 170), and only 99.5 for the luxuries. Conversely, the number of miscellaneous reasons average 42 and 40 for the first two groups, and 86 for the last. Similarly, the cases in which no reasons could be given for the occurrence of a given brand average twice as great a

TABLE III

FREQUENCIES OF BRANDS AND REASONS FOR CLASSIFIED ARTICLES

1	2	3	4	5	6	7	8	9	10
		No. of brands named				No. of reasons named			
2	Necessities or Daily Use	Most freq.	2nd freq.	Misc.	None	None	Use	Adv.	Misc.
3	Soap	121	39	140	..	..	147	121	32
4	Toothpaste	162	78	101	6	6	193	65	30
5	Collar	224	19	51	6	4	197	69	24
6	Shoes	58	21	210	11	1	167	55	67
7	Garter	192	85	12	11	3	186	78	22
8	Hat	149	35	94	22	7	104	90	77
9	Clothes	86	45	144	25	+7	163	86	33
10	Shirt	73	44	143	50	8	123	65	54
11	Total	1066	366	995	131	29	1280	629	339
12	Average	133	46	124	16	4	160	89	42
	Quasi-Necessities								
13	Fountain-pen	100	72	139	..	5	207	58	30
14	Watch	97	60	143	..	..	197	43	60
15	Underwear	248	18	30	4	7	173	76	40
16	Shaving tool	162	17	101	20	1	183	68	29
17	Total	607	167	413	24	13	760	245	159
18	Average	1152	42	103	6	3	190	61	40
	Necessities and Quasi-Necessities Combined								
19	Average	140	40	117	13	3.5	170	73	41.5
	Luxuries or Occasional Use								
20	Tobacco	100	57	139	4	5	76	137	77
21	Soft drink	194	11	90	5	3	85	134	72
22	Camera	157	52	82	9	9	117	99	65
23	Magazine	72	39	178	11	11	141	16	121
24	Baseball	179	53	42	26	14	93	49	120
25	Candy	38	31	196	35	4	76	82	102
26	Penknife	168	14	79	39	8	83	92	78
27	Notepaper	21	13	178	88	3	125	31	53
28	Total	929	270	984	217	57	796	640	688
29	Average	116	34	123	27	7	99.5	80	86

frequency for the last group, named seven, as for the first two groups. Comparing now the relative frequencies of the three sets of reasons with each other, group by group, we find the following relations: In the first group, advertisements are more than twice as frequent as the miscellaneous reasons, but only a little more than half as strong as use. In the second group, use has become three times as strong as advertisements, and the latter is only one and one-half times as strong as the miscellaneous reasons. With the last group, finally, the three sets of reasons are very nearly equal in their frequencies and averages, use leading with 99.5, then miscellaneous reasons with 86, and finally advertisements with 80 as average. This last figure is so low on account of the small influence which advertisements seem to exert in the case of magazine and notepaper. As a matter of fact, these two articles have only recently been subjected to extensive advertising campaigns, the results of which are not yet sufficiently felt to manifest themselves in experiments of our sort.

VI. *Locality.*

The last viewpoint from which we wish to discuss our results in this paper is that of locality. In Table IV our data are classified according to the eight states in which the experiment was carried on. The total number of cases obtained in each state is given immediately below each state. All other numbers in the Table represent percentages. The percentages of the most frequent brand range from 36.0 in Illinois to 54.5 in Pennsylvania, with an average for all states of 46.0. The second most frequent brand obtains the lowest percentage in New York, namely 11.0, and the highest in Texas, namely 17.5. The miscellaneous brands are mentioned most frequently in Minnesota, with a percentage of 32.5, and least frequently in Texas, namely 19.0. The cases in which no brands were named occurred most often in Illinois, with 11.0 per cent.; and least often in Pennsylvania, where no such cases occurred. There are also cases where two or more brands are mentioned equally often either as first, or second, or miscellaneous brands; their percentages are given in the eighth horizontal row as duplicates. The averages for all eight states are given in the last vertical column. There is no state which approaches these averages very closely; perhaps the results from Georgia most nearly resemble them.

In a similar way the percentages of the various kinds of reasons are listed in the rest of the Table. Here, however, we find that the individual states approach the general averages much more closely. The results from Minnesota are most, those from New York are least, like the general averages. The results from New York fall farthest below the general average with regard to "use" and "advertisements;" and conversely, they go highest above the general averages with "miscellaneous" and "no reasons." Pennsylvania, which had no cases of inability to mention commercial brands, has consequently also the lowest percentage for inability to give reasons. The explanation of this phenomenon may probably lie in the fact that the subjects who took this test were also students in a course in business psychology.

Other geographical peculiarities, which are not revealed by Table IV, are such minor important facts as the following. The fact that a large concern which manufactures some article of our list is located near the place of experimentation in one state or another will naturally tend to give to this brand a strong priority over other brands. This factor has, however, never shown its influence to the extent of changing the results of the most frequent brand or reason in that

TABLE IV

PERCENTAGES OF BRANDS AND REASONS, FOR EIGHT LOCALITIES

1	2	3	4	5	6	7	8	9	10	11
2	Localities...	Ga.	Ill.	Mass.	Minn.	Mo.	N.Y.	Pa.	Tex.	Total
3	No. of cases.	400	460	600	1920	2000	260	200	160	6000
Percentages of Brands										Aver.
4	Most. freq..	50.0	36.0	41.0	41.2	52.0	43.5	54.5	50.0	46.0
5	2nd freq....	16.0	11.8	17.0	16.6	15.0	11.0	17.0	17.5	15.0
6	Miscel.....	23.0	29.2	28.0	32.5	30.0	32.0	26.0	19.0	27.5
7	None	5.0	11.0	8.5	7.3	3.0	9.0	....	9.0	6.6
8	Duplicates..	6.0	2.0	5.5	2.4	....	4.5	3.5	4.5	4.9
Percentages of Reasons										
9	Use.....	46.0	40.2	40.0	44.0	57.0	36.3	41.0	42.5	43.4
10	Advertising.	34.0	21.5	29.0	24.5	22.7	20.0	36.5	35.0	27.9
11	Miscel.....	16.5	25.7	18.7	22.5	16.0	29.7	21.5	12.5	20.0
12	None.....	3.5	12.6	12.3	9.0	4.3	14.0	1.0	10.0	8.4

state. Another peculiarity is the naming of some brand after a locality situated near a place of experimenting. This factor has occurred in only one article and state; and there it has not influenced the results to any important extent. From a general comparison of the different states with each other the writer has gained the conviction that further data from college men of other states will not materially change his results. It may, however, be possible that with entirely different types of individuals, for example, with older men or with less well-educated people, certain significant modifications of these results may be obtained. The discussion of the type of subjects and of their sex must be left to a future occasion.

VII. *Summary and Conclusions*

The results and conclusions of the present investigation may be summarized as follows:

1. Our 300 subjects could name 812 different brands or trade-names of 20 familiar articles, or 41 brands per article.

2. In about 7 per cent. of all 6,000 cases they failed to name any brand.

3. The absolute frequencies of different brands for the various articles differ widely, ranging from 12 to 93.

4. The fewer brands of a given article are known, the more widely one or two brands of that article are known.

5. The "community of ideas" with regard to commercial brands is 43 per cent. for the most widely known brands and 13 per cent. for the second most widely known brands. This fact is perhaps the most tangible measure of the variable influences of advertising.

6. In one case out of two a person will think of a commercial brand of a given article because of his personal ownership or previous use of that brand.

7. Advertising is the second most frequent reason for recalling commercial brands of familiar articles, being about one half as effective as use.

8. The 38 miscellaneous reasons for recalling brands of articles taken collectively are less effective than advertising alone.

9. Reasons involving a personal element are twice as frequent as reasons of an impersonal nature.

10. From 12 to 22 different reasons are given per article, with an average of 17.

11. On purely theoretical grounds, and aside from local influences, advertising seems to have five chances out of eight for determining which brand a person may begin to use of his own accord; similarly, all other miscellaneous reasons together have only three chances out of eight.

12. There is much greater "community of ideas" with regard to brands of articles of necessity and quasi-necessity than with articles of luxury and occasional use.

13. Previous use is a much stronger reason for recalling brands of articles of necessity than for recalling brands of articles of luxury.

14. There were no marked differences, either as to brands of articles or as to the reasons for recalling them, between the eight widely separated geographical regions of this country represented in this investigation.

BOOK REVIEWS

WELLS, F. L., *Mental Adjustments*.. New York: D. Appleton and Company. 1917. Pp. xiii+331.

Dr. Wells' book is one of several recent attempts to apply the insight into the fundamental mechanisms of human behavior afforded by psychoanalysis to guiding normal individuals along the paths of mental efficiency and happiness. More particularly it is designed to give those responsible for the formation of character in others the knowledge of the forces to which personalities are subject which will permit the wisest guidance to mental adjustment and its conscious aspect, happiness. Starting with a dynamic conception of mind as a sum of fundamental trends or directions of expending vital energy, the author first offers a discussion of the causes of failures of adjustment. In the animal series maladaptation most frequently comes about through the appearance of exceptional situations for which the normal reactions are inappropriate. In human individuals the maladaptation is usually conditioned by the remoteness of the reaction from the end to which it is directed, or internally through the variety of trends which must be satisfied, with the possibility of conflict. The most striking conflicts rise about the sexual trend owing to its less immediate relation to the individual's survival, its great complexity and lability, and the resistances which have grown up around it; its internal conflicts are on the whole greater than the external difficulties which surround it. One of the chief mechanisms of maladaptation is the shirking of effort necessary to realize the fundamental trends whether by minimising the value of the thing desired, or imagining a realization. A further example of waste of mental energy is found in "autistic" thinking, solutions and explanations by superficial associations which fail to meet the test of concrete reality; this type of thinking is characteristic of maladaptation whether in primitive man, pathological cases, or in the phantastic life of dreams. The conflict of trends often manifests itself in pathological dissociation from the main personality; a chapter is devoted to the discussion of typical examples chiefly from the writer's own observations. He brings out the complex and unstable structure of the mind, with the possibility of the dissociation of one trend from any of the others, and the importance of the unconscious. "Man's special faiths, interests, hobbies, friendships, enmities, ambitions and infatuations are fashioned not from the fraction of experience he can remember, nor yet from the innate features of being he cannot control; but from a body of unconscious experiences vaster than knowledge, which imparts to the objects of consciousness, by affective transference, their human values." A special chapter is devoted to the continuity of emotion (persistence of the emotion independently of the idea to which it attaches) and the possibility of sublimation in the transference of the affect of childish sources of enjoyment to useful trends of conduct. Perhaps the chief differences in character lie in the readiness with which affects transfer from one pursuit to another, and the direction of this transfer is what makes the difference between the superior and the inferior personality. The final chapter contains a conception of all mental trends as "balancing" the output of mental energy, and of happiness as the conscious phase of the adjustment which results from the balance of the supply of energy

with its expenditure. He brings out the mutual consistency of the fully developed economic and erotic trends, the biological significance of social trends, and the minor, in a narrower sense "balancing" values of social service, religion, and recreation, introduced to provide an outlet for the energy left unexpended by the fundamental trends. In conclusion he offers pertinent suggestions towards education from the standpoint of the psychopathologist. He emphasises the necessity of directing education along the lines of fundamental trends, leading to a mastery of one's economic existence and love-life, as opposed for example to the cultivation of intellectual resources for use when other satisfactions fail, the importance of willing competition in the natural striving of one's fellows leading to normal self-assurance, the encouragement of the actively tangible and concretely serviceable ideals that are likely to bring the best adjustments towards life. The book is written in a non-technical, concrete, and readable style (its chief defect lies perhaps in a certain looseness of composition) and succeeds in conveying an illuminating, and at no time exaggerated, point of view and much pertinent counsel.

Clark University. R. B. Teachout.

Norbert J. Melville. *Standard Method of Testing Juvenile Mentality.* With an introduction by William Healy. J. B. Lippincott Company, Philadelphia, 1917. Pp. xi, 142.

This little book is a convenient manual for mental examiners who wish to use the 1911 revision of the Binet-Simon tests. According to the Preface, "the writer intends that this manual may aid in the careful training and exact guidance of an ever-increasing corps of competent examiners who will be able to render first aid in juvenile mental crises by means of a brief scientific investigation." As Dr. Healy points out in his introduction to the Manual, "for final diagnosis of the mentality of the individual, the Binet test score is simply one out of several main facts to be taken into consideration. * * * I confess myself particularly interested in this two-fold attempt to devise more exact methods of using this scale, while at the same time absolutely insisting on the setting of sharp limitations to the interpretation of findings by this scale."

Part I describes the general procedure of gathering and analysing the data according to the author's standard or uniform method, which, as he insists, is not another revision or adaptation of the Binet-Simon tests, but merely a minute description of a large number of details of performance which are ordinarily left to the discretion of the examiner. The tests are arranged in parallel series in such a way that those "tests which the majority of investigators thus far reported have shown to be most highly diagnostic in differentiating the mentally deficient from the normal, constitute the first or *a* series of tests; those next in diagnostic value constitute the *b* series, etc." Furthermore, "those tests which involve the use of similar materials or methods are arranged in the same series so that they will be given in sequence;" thus the directions for the Picture Test, which occurs in years III, VII, and XV are all grouped together. "The standardization is based upon (1), the experiences growing out of an application in over a thousand cases of the recommendations of the Buffalo conference on Binet testing, and (2) a comparative study of the methods used by other investigators."

In connection with a discussion of provisional evaluations and classifications of Binet scores the author presents both a general plan of

orthogenic case study and also several detailed schemata showing (a), an orthogenic table of provisional mental classification based upon the analysis of the Binet record; (b), a provisional psycho-educational classification involving language ability, Binet age difference, mentality, and scholastic group, and (c) Binet's anatomical limits for subnormal boys, as to height and cephalic diameters. The problems of clinical interpretations are presented in the form of abridged quotations from Binet and Simon's original reports. A long list of general and special directions to examiners, together with specimen copies of standardized recording blanks and explanations for their use, are followed by general rules concerning the sequence of tests and the giving of instructions to subjects.

Part II. contains the actual material to be used in the tests, except the objects. The pictures and drawings are arranged in such a way that they face the subject, while the corresponding directions and explanations for using these drawings or pictures face the examiner. Two pages of sample drawings illustrating the standards for scoring the square, the diamond, and the other two figures, are included in the appendix.

The proper use of this manual should contribute greatly to a more uniform and standardized application of the Binet-Simon tests and help to dispel the widespread fatal notion that a little common sense is all that is necessary for the performance and interpretation of general mentality tests.

L. R. G.

RUDOLPH PINTNER AND DONALD G. PATERSON. *A Scale of Performance Tests.* New York: D. Appleton and Co., 1917. Pp. 217.

One great drawback in most of the mental tests now in use is the necessity of language responses on the part of the pupil examined. Just how much the ability to handle language is indicative of intelligence is a question at issue. The clinical psychologist in the large city is face to face with the problem of the foreign child, the speech defective, the deaf child, and other children with language difficulties. This has led to the type of test now generally known as the performance test, the essential characteristic of which is the elimination of a language response on the part of the child.

The present volume offers a detailed description of the use of fifteen performance tests selected largely on the basis of variety, adaptation to new situations, and freedom from verbal instructions and responses. The remainder of the book is devoted to a discussion of methods of standardizing tests and establishing reliable norms. Data from the fifteen tests described are arranged in tables of distribution and then manipulated in order to show various means of scoring. In the year scale tests are grouped with the supposition that the average child of a particular age will pass all the tests of the year scale at the age in question and all below and none above that year. But a particular child usually passes tests scattered over several years. Credit for these tests leads to the computation of a mental age. The authors then suggest the use of a "median mental age." Given a group of tests which have been adequately standardized and for which the median performance at each age is available, then the measure of an individual's intelligence is the median of all the mental ages which he approximates in all the tests. The authors are inclined to question the validity and justification of the point scale method, especially the arbitrary allotment of credit which Yerkes and Bridges assign to their

scale. Two drawbacks are apparent in the point scales: The fact that the cases must be tested on all the tests of the scale to establish valid norms, and that with an individual case all tests must be employed before the results can be used with advantage. The percentile method of scoring offers perhaps the best possibility for future work. The percentile division can be made as small as the delicacy of the tests will warrant. This method is desirable because it permits comparison of an individual's performance with those of other individuals of the same age. Tests may also be omitted and admitted very readily in such a scale. This gives great flexibility to the scale.

C. C. PRATT.

HARRY D. KITSON. *How to Use Your Mind.* Philadelphia and London. J. B. Lippincott Company, 1916. Pp. 215.

The author in the preface states the general purpose of the book. "Educational leaders are becoming increasingly aware of the necessity for teaching students not only the subject-matter of study but also methods of study. Teachers are beginning to see that students waste a vast amount of time and form many habits because they do not know how to use their minds." The recognition of this condition is taking the form of the movement toward "supervised study" which attempts to acquaint the student with principles of economy and directness in using the mind. There are certain "tricks" which make for mental efficiency such as devices for arranging work, methods of review, methods of taking notes and rules for memory. These devices are in some cases the results of psychological experimentation and in others the results of experience. It is the purpose of the author to systematize these experiments and make them available in a textbook.

The book is designated by the author as "A Psychology of Study," being a manual for the use of students and teachers in the administration of supervised study. The text is divided into twelve chapters: Intellectual Problems of the College Freshman; Note Taking; Brain Action During Study; Formation of Study Habits; First Aids to Memory; Concentration of Attention; How We Reason; Expression as an Aid in Learning; The Plateau of Despond; Mental Second Wind; Examinations and Bodily Conditions for Effective Study.

The principles as outlined by Dr. Kitson are not new but have been brought together and systematized in such manner as to make a very readable and interesting text. The volume will be of service to anyone interested in economical and effective methods of study.

A criticism might be made of the treatment of Chapter III, "Brain Action During Study." This chapter contributes little to the effectiveness of the text. It is difficult to see how such a popular and non-technical treatment would be of any service to the student or general reader.

The author has in no way indicated the principles that are of primary importance. The effectiveness of the book for general use would have been increased if the author had summarized the important principles or rules at the close of each chapter. The reviewer is not sure that the title. "How to Use Your Mind," is justifiable.

J. A. STEVENSON.

WILLIAM A. WHITE. *Mechanisms of Character Formation.* The MacMillan Company, 1916, pp. 335.

This introduction to psychoanalysis brings together into compact and readable form the essential principles of the Freudian psychology.

This, the author believes, "is the psychology which will prove of the greatest pragmatic advantage" since it is the first to realize that a mental event can only be understood as the end result of the past mental life of the individual and of the race. He, therefore, suggests that it be taught in the medical schools in a form similar to that outlined in this book. From a brief historical introduction he passes to the consideration of the "Genetic Approach to the Problem of Consciousness," which with the three following chapters upon the "Unconscious," the "Conflict," and "Symbolism," deals with the general questions "which define the placement of the psyche in the evolutional scheme." Man is to be regarded as a "biological" unit, as the material in and through which energy manifests itself in a constant tendency, with an unremitting effort to develop." This energy, the "libido" or creative force, is the "same in kind whether found at work in the individual cell, in the functioning of an organism, or in the psyche." In order to produce results, this creative force must overcome the resistances offered to the organism by its environment, and hence conflict, the action and reaction of opposing forces, is the fundamental factor in its development. Conflict is the "very root and source of life." While in the lower organisms it is expressed in the tropisms and the reflexes by which the individual adjusts himself to his surroundings, in man it is manifested in the consciousness which arises when the complexity of a situation demands a choice of actions. In the human individual, the creative force takes the fundamental forms of self-preservation and race preservation, both of which early come into conflict with his social environment. The result is a repression of these instinctive tendencies, which are forced down below the conscious level, where they remain as the great submerged mass of the unconscious, "that portion of the psyche which has been built up and organized in the process of development." But the "unconscious in its anti-social and unconventional tendencies can only express itself in consciousness under the form of a symbolism which at the same time effectually disguises its real meaning." The symbol thus serves as a "transmitter" of energy, and as a "transmuter" as well, since by its larger and more universal application it opens the way for the energy to pass into wider and more complex paths.

The remaining chapters of the book are devoted to a more detailed discussion of the means by which this creative energy strives to rise above its limitations and deal with its environment efficiently; the "various mechanisms which are utilized at the psychic or symbolic level in dealing with the two-fold problem of integration and adjustment" of the individual to his environment. Here are discussed the "Dream Mechanisms" familiar to Freudian readers; the "Family Romance," as the author prefers to call the neuroses representing the infantile attachment to the family situation; the "Will of Power," and "Partial Libido Strivings," in which are discussed the abnormalities arising when the check of reality is too strong to be overcome by the vital force, which therefore finds its outlet in ways harmful to the efficiency of the organism. In the chapter upon "Extroversion and Introversion," the distinction is drawn between those individuals whose energy tends to flow out upon the external world, and those whose interest is directed upon their own inner world; while the following consideration of "Organ Inferiority" contends "if at any point. . .an inferior organ is unable to do its share of the work, then the concessions which have to be made to this defect and the compromises that have to be effected as a result of it must ultimately find their expression at the psychological level." In the concluding chapters on the "Resolu-

tion of the Conflict" and "Summary and Synthesis," the author again returns to the value of the symbol as the "energy carrier from one level to the next higher level in this process" of development.

Throughout there is a wealth of illustrations drawn from pathological and child psychology, as well as from that of primitive man, in the explanation of the various technical terms. The book is one of the first attempts to gather together and systematize the various principles of psychoanalysis and as such is invaluable as an introduction and a summary in this field.

E. Bowman.

Daniel Starch. *Advertising: Its Principles, Practice, and Technique.* Scott, Foresman and Company, Chicago, 1914, pp. 281.

As appears from the preface, this book is intended to serve "as a textbook for students and as an introductory handbook for business men." The author has endeavored to combine the practical and the theoretical aspects of the subject in such a way that the practical experiences of business houses, which are quoted at length, may illustrate the underlying principles, and that the discussion of principles may illuminate the practical results of business.

Advertising specialists all over the country agree that Professor Starch has contributed the best book on advertising thus far, considering its simplicity, accuracy and helpfulness.

The contents cover the following phases of advertising: The place of advertising in the business world; problems of advertising; attracting attention; reaching the people; display type.—its attention—value and use; the size of advertisements; emphasis and unity in advertisements, avoidance of counter-attractions; contrast, the use of colors and novel features; borders, eye-movement and attention; mediums,—magazines, newspapers, street railway cards; trade names and trade marks; headlines; illustrations; repetiton and cumulative effect; type and legibility; artistic elements in advertisements; arrangement, balance, and harmony; argumentative advertisements; suggestive advertisements; testing the strength of advertisements; the ethics of advertising.

The organization of the material is excellent. The changes in the methods and ideals of advertising are taken up and illustrated by the type of copy used by the leading firms. The results of investigations by various firms to determine the efficiency of the advertisements are given in detail. Professor Starch presents the results of laboratory experiments, and the relation between these experiments and that "of the advertisement in operation is always clearly shown." But the function of an advertisement is to attract attention, to stimulate interest, and to secure a response, and the psychological principles which underlie the construction of the advertisement itself, are taken up in detail. It should be noted that psychological technicalities are avoided so that the material is easily understood by the average reader.

It is estimated that in the United States eight hundred million dollars are spent annually for the purpose of advertising, and the printed space consumed would cover two thousand square miles. A full-page advertisement in the back issue of a leading magazine for women, for only one issue, cost ten thousand dollars. The problem of the advertiser is a large one, and this book should be looked upon as a primer of the science and practice of advertising.

Teachers of advertising will welcome this text-book for it presents fundamental principles in such a concrete form that the students can

readily absorb them. Professor Starch is the first writer to produce a text-book on advertising that anywhere near fills the need. This volume should be read by every one interested in any phase of advertising.

JOHN A. STEVENSON.

The following books and pamphlets have been received:[1]

ELLSWORTH HUNTINGTON. *Civilization and Climate.*. Yale University Press, New Haven, 1915.

Indiana University Studies, No. 32. Studies in Arithmetic. Edited by MELVIN E. HAGGERTY, Vol. 3, September, 1916. No. 34. *The Ability to Read: Its Measurement and Some Factors Conditioning it.* Edited by MELVIN E. HAGGERTY, Vol 4, January, 1917.

ROBERT M. YERKES AND HAROLD E. BURT. *The Relation of Point-Scale Measurements of Intelligence to Educational Performance in College Students.* Reprinted from *School and Society,* Vol. 5, No. 123, pp. 535-540. May, 1917.

HAROLD E. BURT. *Auditory Illusions of Movement—A Preliminary Study.* Reprinted from *Journal of Experimental Psychology,* Vol. 2, No. 1, February, 1917.

J. E. WALLACE WALLIN. *The Feebleminded in the State of Missouri.* Reprinted from *The Psychological Clinic,* Vol. 11, No. 2, April, 1917.

—— ——. *A Program for the State Care of the Feebleminded and Epileptic.* Reprinted from *School and Society,* Vol. 4, No. 98, November, 1916.

—— ——. *The Problem of the Feebleminded in its Educational and Social Bearings.* Reprinted from *School and Society,* Vol. 2, No. 30, July, 1915.

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[1] Mention here does not preclude further comment.

NOTES

The following items of general interest are quoted from the Phi Delta Kappa News Letter, (Chicago Chapter), June 1917:

Dr. F. N. Freeman of the University of Chicago, has been directing an investigation of the handwriting of adults by the use of the kinetoscope. The first step of the process is to photograph with the motion picture camera operating at a certain number of exposures per second, usually about thirty, and from a position directly above the page, the whole writing process, forearm, hand, pen, writing, etc., while the subject is in action. Not only the superior but also by an arrangement of mirrors, the lateral and front views of the hand, penholder, and fingers are obtained. The film is then developed and the image projected so as to be greatly enlarged. By running the projectoscope at a desired rate of speed the movements used by the writer are clearly evident and subject to repeated observation. For closer analytical study the individual pictures are projected and the positions of the fingers, hand, arm, and pen studied or even outlined on drawing paper for exact measurements. The speed of the penpoint with the stroke is also clearly shown by noting its position at each exposure and measuring the distance which it passes over between successive exposures.

The movements of the eyes in reading present many unsolved problems. Last year Mr. C. T. Gray made quite an extensive study of the differences in eye movements between good and poor readers. The apparatus which he designed, with a few minor changes, is being used for further study this year (by Mr. A. R. Gilliland). A small bead soldered to a pair of spectacle frames is used to reflect a ray of light on the film by which movements of the head and shifts of the film may be detected. By keeping this bead line as a constant point of reference in reading the films it is possible to determine with relative certainty the exact letter fixated. The problem of the difference between reading aloud and silently is being studied to determine the essential differences in eye movements. It is to be hoped that some light may be gained as to the differences between the mental processes in these activities. The difference in eye movements in reading different sized type is also being studied. Other tests should determine whether we actually see more of the letters than has been supposed.

Dr. H. D. Kitson is engaged in a study of the psychology of proofreading, with an end of determining the factors that influence the speed and accuracy of proofreading, and with the hope of devising tests that will be of assistance in the employment of proofreaders. The last problem is especially carried on by Mr. A. Howell.

An extensive study of the problems of gifted children has been carried on during the past year under the direction of Professor G. M. Whipple at the University of Illinois, with a special fund appropriated for this purpose by the General Education Board. Miss Genevieve L. Coy (M. A., 1915, Columbia University), has given her full time to the problem of selecting mentality tests by means of which children of superior intelligence can be quickly and accurately selected from a heterogeneous group. Mr. T. S. Henry (Ph.D., 1917, Univ. Ill.) has

investigated class-room problems in the education of gifted children, while Mr. H. T. Manuel (Ph.D., 1917, Univ. Ill.), made a special study of talents in drawing in adults and children above ten years of age. A special teacher was also engaged last September and connected with the public schools of Urbana, Ill., to teach a class of thirty children selected as superior on the basis of teachers' judgments and school records. The children varied in chronological age between nine years seven months and twelve years three months on October 1, 1916. Their mental ages by the Binet-Stanford scale varied between ten years three months and sixteen years one month, and their I. Q.'s from 99 to 147. The purpose was to determine whether by special instruction these children could master two years' school work in one year. It was found that at least eighty per cent. will be able to enter next fall two grades above the one they entered in the previous year. Miss Coy's results have definitely brought out the fact that teachers' judgments and school records furnish a very unreliable basis for differentiating between normal and supernormal children, but that a few hours devoted to well selected mentality group tests result in a sharp and reliable differentiation between the two groups of children. Miss Coy will probably continue the work of studying supernormal children next year in the Department of Psychology of the Ohio State University.

The Fourteenth Annual Report of the Director of the Carnegie Institute of Technology for the year ending March 31, 1917, includes the Second Annual Report of the Division of Applied Psychology, including the Department for the Training of Teachers and The Bureau of Mental Tests, from which the following items are quoted below:

D. Walter Dill Scott, of Northwestern University, the foremost American authority on psychology in its application to business was secured as Director of the newly-organized Bureau of Salesmanship Research to conduct the five-year experiment in vocational selection described later. Dr. Scott was also appointed to the faculty with the title of Professor of Applied Psychology. During his absence Professor G. M. Whipple of the University of Illinois has been selected to serve as Acting Director of the Bureau of Salesmanship Research.

This coöperative enterprise of thirty business concerns with selling organizations of national scope is concentrating its efforts on a study of the problems of the human element in marketing: the salesman, his selection, training and supervision. The cost of the Bureau is chiefly met by the business firms which contribute $15,000 a year toward the expenses of the research. The Carnegie Institute of Technology in turn furnishes office quarters, laboratories, equipment and supplies. Dr. Scott's research course has already resulted in a volume entitled "Aids in the Selection of Salesmen," containing model forms for application blanks, letters to former employers, interviewers' guides and record blanks and a set of tests to be used as a supplementary means of determining the applicant's intelligence, alertness, carefulness, imagination, resourcefulness and verbal facility — qualities which contribute to effective salesmanship. In this work Dr. Scott has had the help of six research assistants and the coöperation of Drs. B. G. Miner, G. M. Whipple, and W. V. Bingham, head of the Division of Applied Psychology.

Professor C. E. Seashore of the department of psychology at the University of Iowa has recently issued a bulletin, entitled *Vocational Guidance in Music*, in which he describes his newly established Psychology of Music Studio. Nature's gift of musical endowment can be

measured by a system of psychological tests which deal with the most salient features of musical talent — sensitivity to tones, the time-sense, the sense of rhythm, the sense of harmony and melody, musical memory, musical imagination, musical feeling, musical intellect, and musical expression in singing and playing. From this system of measurements it is possible to decide whether or not a musical education is worth while in any given case, why such an education should be of one kind rather than of another, what musical powers are most promising for cultivation, what powers need special training, what pitfalls are to be avoided, etc. The record obtained from the test of an individual is expressed in a "chart of musical talent." A complete and thorough examination of an individual includes twenty measurements and requires three days of continuous work. The staff of the Studio is prepared to make a limited number of surveys for vocational guidance in music among the children of the public schools. The results of these surveys will, however, be only tentative, yet they may serve "as a sort of drag-net by means of which marked talent or lack of talent will be revealed." The Studio is conducted in connection with the Psychological Laboratory of the University of Iowa; it is in charge of a psychologist and a musician, with a corps of trained assistants who make the measurements by approved psychological methods; the Studio is equipped with apparatus which has been specially designed for this work. This new and unique movement serves as another illustration of the variety of fields of human activity in which the applications of psychology promise to be helpful and fruitful.

Psychological tests of candidates for the aviation corps are now being conducted at the Massachusetts Institute of Technology by Dr. H. E. Burtt, at the University of California by Professor G. M. Stratton, and at the University of Pennsylvania by Professor F. N. Maxfield.

PSYCHOLOGY AND NATIONAL SERVICE

Among the many scientific problems which the war has forced upon the attention of our military authorities there are several which are either psychological or present a psychological aspect. In the opinion of experts many of these problems are immediately soluble and it therefore becomes the duty of professional psychologists to render national service by working on such problems. For this reason a committee on psychology has been organized with the approval of the council of the American Psychological Association, by the National Research Council. This committee consists of J. McKeen Cattell, G. Stanley Hall and E. L. Thorndike from the National Academy of Sciences; Raymond Dodge, S. I. Franz and G. M. Whipple from the American Psychological Association, and C. E. Seashore, J. B. Watson and R. M. Yerkes, Chairman (member of the National Research Council) from the American Association for the advancement of Science.

At the first meeting of the committee, it was voted "that whereas psychologists in common with other men of science may be able to do invaluable work for national service and in the conduct of the war, it is recommended by this committee that psychologists volunteer for and be assigned to the work in which their service will be of the greatest use to the nation. In the case of students of psychology, this may involve the completion of the studies on which they are engaged."

It is the function of this general committee to organize and, in a general way, supervise psychological research and service in the present emergency. Problems suggested by military officers or by psychologists are referred by the committee to appropriate individuals or institutions for immediate attention. Already at the suggestion of the council of the American Psychological Association the chief psychological laboratories of the country have been offered to the committee for such use as the military situation dictates. Moreover, the membership of the American Psychological Association, in response to a letter addressed to it by the council, has responded most promptly and heartily with offers of personal service.

At a meeting held in Philadelphia, April 21, the council of the American Psychological Association, in addition to approving and urging the appointment of a committee on psychology for the National Research Council, authorized the organization of twelve committees to deal with various important aspects of the relations of psychology to the war.

The list of committees with their personnel, so far as at present announced, follows, together with brief comment on the status of their work:

COMMITTEES

Committee on Psychological Literature Relating to Military Affairs.—It is the function of this committee to prepare bibliographies and abstracts of important psychological military contributions for the immediate use of committees, individual investigators, and for publication. Chairman, Madison Bentley, University of Illinois. Dr. Bentley already has rendered valuable service to several of the committees.

Committee on the Psychological Examining of Recruits.—The first task of this committee is the preparation and standardization of methods and the demonstration of their serviceableness. Chairman R. M. Yerkes, Harvard University, W. V. Bingham, H. H. Goddard, T. H. Haines, L. M. Terman, F. L. Wells, G. M. Whipple.

This Committee has prepared a method of group examining, and also varied methods of individual examining. The work, covering a period of four weeks, was generously financed by the Committee on Provision for the Feeble-minded. The methods are now being tested in three army camps and one naval station. The expense of this initial trial, which is made primarily for the further development and perfecting of the methods, is met by an appropriation of twenty-five hundred dollars made by the Committee on Furnishing Hospital Units for Nervous and Mental Disorders to the United States Government. At the present writing, the Surgeon-General of the Army awaits lists of psychologists who are both adequately prepared and willing to serve as psychological examiners.

It is the conviction of the committee that the psychological examiner, by applying specially prepared and adapted methods to recruits in the camps, should obtain measurements valuable alike to line officers, to general medical officers, and to the special officers in charge of the psychiatric hospital units.

It is assumed that the work of the psychologist, although not strictly medical in character but instead vocational, educational and social, will supplement that of the medical examiner by supplying him with information otherwise not available. Further, the psychologist may aid the psychiatrist by detecting and referring to him those individuals for whom careful psychiatric examination is obviously desirable.

Committee on the Selection of Men for Tasks Requiring Special Skill.—This includes the selection and promotion of officers, as well as the choice of men for varied kinds of skilled service. Chairman, E. L. Thorndike, Columbia University, J. C. Chapman, T. L. Kelley, W. D. Scott.

A new method of selecting officers devised by Dr. Scott is now in use in many of the Officers' Training camps.

Committee on Psychological Problems of Aviation, Including Examination of Aviation Recruits.—Chairman, H. E. Burtt, Harvard University, W. R. Miles, L. T. Troland.

Work looking toward the development and thorough testing of methods for the selection of aviation recruits has been authorized by the government and already is in progress in at least one of the institutions where the recruits are being trained.

Committee on the Psychological Problems of Incapacity, Especially

Those of Shock, Reëducation and Vocational Training.—Chairman, S. I. Franz, Government Hospital for the Insane, J. B. Watson, K. S. Lashley.

The task proposed for this committee is a large and diffcult one and the chairman plans to organize, in intimate relations with various military activities and agencies, a committee which shall be competent to deal with the varied scientific problems of incapacity.

Dr. Franz has himself developed successful methods for the reëducation of certain paralytics, and according to our information his methods are now used by the Military Hospitals Commission of Canada. It is greatly to be hoped that his own country may be equally ready to avail itself of these methods, and that it may adequately prepare in advance for the extremely important as well as difficult task of rehabilitating maimed and paralyzed soldiers and sailors.

Committee on Psychological Problems of Recreation in the Army and Navy.—Chairman, G. A. Coe, Union Theological Seminary, W. C. Bagley, H. L. Hollingworth, G. T. W. Patrick, J. H. Tufts.

This committee will serve the national cause by coöperating in every profitable way with the committee on military recreation of the Y. M. C. A., and with such other agencies as are immediately concerned with this kind of military aid. Psychologists will find abundant opportunity for the study of psychological aspects of recreational problems.

Committee on Pedagogical and Psychological Problems of Military Training and Discipline.—Chairman, C. H. Judd, University of Chicago.

Committee on Problems of Motivation in Connection with Military Service.—Chairman, W. D. Scott, Northwestern University, H. S. Langfeld. J. H. Tufts.

Committee on Problems of Emotional Stability, Fear and Self-control.—Chairman, R. S. Woodworth, Columbia University, W. B. Cannon, G. S. Hall, J. B. Morgan, J. F. Shepard.

It is probable that in addition to dealing with the special problems of emotional stability this committee will find it desirable to undertake a careful study of incorrigibility.

Committee on Acoustic Problems of Military Importance.—Chairman, C. E. Seashore, University of Iowa, R. M. Ogden, C. A. Ruckmich.

Already the chairman of this committee has interested himself in the relations of the principles of acoustics to various naval situations. Methods of localizing sounds and their utilization for the detection of submarines, the identification of guns, and the locating of batteries are clearly important. These questions are under investigation by the Physics Committee of the National Research Council, with which Dr. Seashore's committee will coöperate.

Committee on Visual Problems of Military Significance.—Chairman, R. Dodge, Wesleyan University, R. P. Angier, H. A. Carr, L. R. Geissler, S. P. Hayes, G. M. Stratton, L. T. Troland.

Chairman Dodge has devised and perfected an apparatus for the measurement of various important aspects of the naval gunner's reaction. This is now installed for trial on a number of battleships. The Committee has also been requested to prepare and recommend to the Navy methods for the selective examining of men for various kinds of service. This work is in progress and its results will shortly be reported to the officials directly concerned.

If the war continues for as much as a year American psychologists will have opportunity to serve importantly, not only in the examining and classifying of recruits but also in the selection of men for positions of responsibility, and in the choice and training of aviation recruits, naval gunners and others in skilled service. It is no longer a matter, as at first appeared to be the case, of inducing military authorities to accept methods of psychological measurement, but instead primarily one of meeting their expressed needs and requests for assistance.

As psychological research along such lines as have been indicated above progresses and as the applicability and serviceability of methods are demonstrated and rendered increasingly clear, it is probable that effective use can be made by the government of all scientists who are skilled in the study and control of human behavior. For after all the human factors in war are as important as are the mechanical and it cannot be doubted that brains and not brawn will decide the great conflict.

R. M. YERKES,
Chairman

Directory of American Psychological Periodicals

American Journal of Psychology—Worcester, Mass.: Florence Chandler.
Subscription $5. 600 pages annually. Edited by G. Stanley Hall.
Quarterly. General and experimental psychology. Founded 1887.

Pedagogical Seminary—Worcester, Mass.: Florence Chandler.
Subscription $5. 575 pages annually. Edited by G. Stanley Hall.
Quarterly. Pedagogy and educational psychology. Founded 1891.

Psychological Review—Princeton, N. J.: Psychological Review Company.
Subscription (with Psychological Bulletin) $6. 480 pages annually.
Bi-monthly. General. Founded 1894. Edited by Howard C. Warren.

Psychological Bulletin—Princeton, N. J.: Psychological Review Company.
Subscription $3.25. 480 pages annually. Psychological literature.
Monthly. Founded 1904. Edited by Shepherd I. Franz.

Psychological Monographs—Princeton, N. J.: Psychological Review Company.
Subscription $4 per vol. 500 pages. Founded 1895. Ed. by James R. Angell.
Published without fixed dates, each issue one or more researches.

Psychological Index—Princeton, N. J.: Psychological Review Company.
Subscription $1.25 200 pages. Founded 1895. Edited by Madison Bentley.
An annual bibliography of psychological literature.

Journal of Philosophy, Psychology and Scientific Methods—New York:
Sub-Station 84. Bi-weekly. 728 pages per volume. Founded 1904.
Subscription $3. Edited by F. J. E. Woodbridge and Wendell T. Bush.

Archives of Psychology—Substation 84, New York: Archives of Psychology.
Subscription $5. 600 pp. ann. Founded 1906. Edited by R. S. Woodworth.
Published without fixed dates, each number a single experimental study.

Journal of Abnormal Psychology—Boston: Richard G. Badger.
Subscription $4. 480 pages annually. Edited by Morton Prince.
Bi-monthly. Founded 1906. Entire field of abnormal psychology.

Psychological Clinic—Philadelphia: Psychological Clinic Press.
Subscription $1.50. 280 pages annually. Edited by Lightner Witmer.
Monthly (9 numbers). Orthogenics, psychology, hygiene. Founded 1907.

Training School Bulletin—Vineland, N. J.: The Training School.
Subscription $1. 160 pages annually. Ed. by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Journal of Race Development—Worcester, Mass.: Louis N. Wilson.
Subscription $3. 460 pages annually. Founded 1910.
Quarterly. Edited by George H. Blakeslee and G. Stanley Hall.

Journal of Educational Psychology—Baltimore: Warwick & York.
Subscription $3. 600 pages annually. Founded 1910.
Monthly (10 numbers). Managing Editor, J. Carleton Bell.
(Educational Psychology Monographs. Edited by Guy M. Whipple.
Published separately at varying prices. Same publishers.)

Journal of Animal Behavior—Cambridge, Mass.: Emerson Hall.
Subscription $5. 460 pages annually. Founded 1911.
Bi-monthly. Robert M. Yerkes, Managing Editor.

The Behavior Monographs—Cambridge, Mass.: Emerson Hall.
Subscription $5. 450 pages per volume. Edited by John B. Watson
Published without fixed dates, each number a single research.

Psychoanalytic Review—New York: 64 West 56th Street.
Subscription $5. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Ed. by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology—Princeton, N. J.: Psychological Review Company. 480 pages annually. Experimental. Founded 1916.
Subscription $3.25 Bi-monthly. Edited by John B. Watson.

Journal of Applied Psychology—Worcester, Mass.: Florence Chandler.
Subscription $4. 400 pages annually. Quarterly. Founded 1917.
Edited by G. Stanley Hall, John Wallace Baird and L. R. Geissler.

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